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THE TICS AND ALLIED CONDITIONS.*

OPENING PAPERS.

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CONFUSION still lingers round the unwieldy and heterogeneous group of 'involuntary movements' or 'movements of the nerves.' A host of ill-differentiated, sometimes contradictory and far from mutually exclusive expressions—electric, fibrillary, variable and habit choreas; choreic epilepsy, electrolepsy; habit-spasm, myospasm, myokymia; myoclonus, monoclonus, polyclonus, paramyotonus, paramyoclonus, myoclonotonus—bewilder the student, yet some of them, bad though they are, stand for clinical entities, and will scarcely now be abandoned. The first duty of the clinician is to separate such classes of movement as appear to have distinctive characters and to insist on the adoption of an unvarying terminology for each, which may in some measure convey an idea of its nature.

In the course of the last two or three decades the word 'tic' has come into vogue in England for a particular type of involuntary movement. Current in popular usage in France for three hundred years, as a term for a habitual, unpleasant gesture, its aptness, brevity, and non-committal character have ensured it a place in the vocabulary of the neurologist, notwithstanding its unscientific form. Overcharitable use of it, however, is in danger of covering a multitude of diagnostic sins.

DEFINITION.

The distinctive features of tic are embodied in Meige and Feindel's definition:

"A tic is a co-ordinated purposive act, provoked in the first instance by some external cause or by an idea; repetition leads to its becoming habitual, and finally to its involuntary reproduction without cause and for no purpose,

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at the same time as its form, intensity, and frequency are exaggerated ; it thus assumes the characters of a convulsive movement, inopportune and excessive ; its execution is often preceded by an irresistible impulse, its suppression associated with malaise. The effect of distraction or of volitional effort is to diminish its activity ; in sleep it disappears. It occurs in predisposed individuals, who usually show other indications of mental instability."

In addition to varieties of a clonic kind, as most are, the occurrence of slower, more tonic, movements is accepted by these authors as one of the manifestations of the processes underlying tic.

Tic is not synonymous with convulsion, although we must not lose sight of the element of exaggeration implied in the conception ; nor is it a spasm, a term to be reserved for motor phenomena the result of irritation on a reflex arc ; nor, again, is it a stereotyped act, or stereotypy, by which is signified an unexaggerated normal movement repeated involuntarily only at certain times ; the tip of the tongue is sometimes protruded during laborious writing ; a ' face ' is made when a hard service is given or taken at tennis, or when the golfer hits a mighty drive. A famous neurologist used invariably to pout his lips in a to-and-fro movement while examining the optic discs by the indirect method, and at no other time.

The important points to grasp are the psychical origin of tic ; the existence of a psychical defect in impairment of volition, and of a motor defect in the disfigurement or caricature of a normal movement, repeated in season and out of season, but usually containing the recognizable germ of what was once a purposive act of cortical birth ; the malaise that accompanies its repression and the relief succeeding its performance ; its painless nature and its disappearance in sleep.

Cruchet's definition is in the following terms :

" Tic consists in the execution—short, abrupt, sudden, irresistible, involuntary, inapposite, and repeated at irregular but frequent intervals—of a simple isolated or complex movement which represents objectively an act intended for a particular purpose."

In his affirmation that a tic, to be a tic, must be clonic, Cruchet disagrees with the tenets of Meige and Feindel. However much his definition emphasizes the clonic element in tic, Cruchet makes a subdivision into " habit tics " and " convulsive tics," of which the former are exactly comparable to normal movements, except that they are involuntary at the moment of their execution, are performed for no reason or purpose, and their frequency is unusual. Their difference from convulsive tics is merely one of degree ; a habit tic may become a convulsive tic, and some are convulsive from the beginning. A habit tic, if the movement be a slow one, is closely allied to the " tonic tic " ; and it is not always practicable to draw a distinction between them. Thus Cruchet admits that the clonic element in tic may be minimal, so that the differences between his and Meige's views are by no means so insuperable as might be imagined.

What he calls a habit tic is equivalent to the stereotyped act of the others, who hold, as we have seen, that the movement of tic differs from the normal movement not merely by being involuntary, irresistible, inapposite, and so on, but also by being exaggerated.

It cannot be denied that in many cases of tic this exaggeration of the normal movement is anything but obvious; many conform absolutely to the definition of Meige and Feindel, except that the movements are not violent, or grotesque, or 'caricatures.' To withhold the term 'tic' on this account would be rather unfortunate, especially as no standard exists whereby to estimate exaggeration. Enough has been said, however, to demonstrate how insignificant are the discrepancies between the rival definitions. Cruchet has also adduced evidence in favour of the occasional persistence of tic during sleep, which has been accepted, as far as tics of the neck are concerned, by Meige.

Sex, age, and race are without special influence on the development of tic, except that it is unknown in infancy. The frequency of a hereditary psychopathic diathesis emphasizes the kinship of tic with the psychoses and psychoneuroses generally, and although tics abound in degenerates of all sorts a combination of mental instability and intellectual superiority has been repeatedly observed in the families of tiqueurs. Many figures celebrated in history had their tic.

SYMPTOMATOLOGY.

1. *General Symptomatological Characters.*

(*a*) The student should familiarize himself at the outset with the marked *variability in the type of motor reaction* seen in tic. It may be slow or rapid, deliberate or abrupt; it may recur at long or short intervals; it may be simple or complex, single or multiple. Notwithstanding the general impression of the 'convulsive' or 'clonic' nature of tics, stress is laid on the importance of recognizing an occasional 'tonic' or 'attitude' variety, more commonly, perhaps, in the form of torticollis than in any other. A blinking tic, also, is apt to become 'tonic.' Again, the intensity of the muscular contraction ranges through all degrees of mildness or severity, feebleness or violence. Actual muscular hypertrophy may result. A patient will sit quietly outside the consulting room door, but his entry is heralded by a perfect riot of tic-movements, as though all were struggling for simultaneous expression.

Rarely is the motor reaction localized in a muscle group possessing functional independence; usually groups are implicated, often unilaterally, corresponding to motor aptitudes of one or other side. Tic, especially in young persons, is frequently multiple and migratory; a patient naively said she supposed "it gets tired of being always in one place"—the impersonal "it" incidentally illustrating the real nature of the affection. Some youthful tiqueurs have a large repertory, and give quite a variety performance. Often enough, however, a monosymptomatic, unvarying tic is encountered.

(*b*) Tic is grafted on an *abnormal mental state* characterized by volitional instability, and in not a few instances by a degree of mental infantilism. However high the general level of intellectual attainment, mental instability stands revealed in the fickle and unsustained volition that permits the development of the psychomotor defect. In many cases the general intellectual level is not notably advanced, while in other instances there is mental inferiority or gross mental defect. This unstable, capricious will has its counterpart in general inhibitory imperfection. Some people find irksome the active inhibition necessary during the operation of getting their hair cut; but the classical tiqueur flits from one subject or object to another with the restlessness and volatility of a Miss Mowcher.

During my examination of a tiqueuse she kept rolling and unrolling a magazine in her hands till I called her attention to the fact, when she at once said she had not noticed what she was doing. Throwing it away she began to finger the top button of her nightdress and twisted it violently enough to get it off.

(*c*) No feature is more prominent in tic than its *irresistibility*. The strain in holding the movement back is as great as the relief in letting go. A patient said, "You can't help it any more than you can help sneezing." The element of compulsion links the condition intimately to the vast group of obsessions and fixed ideas. Many tiqueurs complain of feeling pent up, and of seeking an outlet somehow.

A patient was consumed with a desire to strike her hips with her closed fists, or her sides with her elbows; the movements became involuntary and almost unwitting, yet the relief was always pleasant; as she said, "any jerking movement seems to relieve my feelings."

Arising out of this, it should be clear that no case of the disease has been properly investigated in which the possibility of the particular tic or tics furnishing a clue to the underlying mental state is ignored. They are the exteriorization of some impelling idea whose origin, lost though it may be to the patient's consciousness, can by suitable methods be discovered. A few tics are of sexual significance; the great mass of them have other meanings. Thus the wild swinging and bending movements of a patient's head were ascertained to be an almost unbelievable exaggeration of an original side-to-side motion of the chin to soften the stiffness of the collar of a policeman's tunic worn years previously. Mention should also be made of the *efficacious antagonistic gesture* (Meige) elaborated by many to cheat their tic; unfortunately this gesture often turns into a tic itself. Others with misplaced ingenuity invent some mechanical arrangement to counteract the unpleasant movement, and in the end become slaves of thier apparatus.

A patient with a retrocollic tic used to hook his head into the vertical position with a crook-handled walking-stick, which worked marvellously for a time, but in the end it became a moot point whether the tic or the bizarre appearance of leading himself forward by the neck was the more conspicuous.

2. *Localization and Varieties.*

The varieties of tics are limited only by the number of functional acts of which they may be the caricature, and that number is legion.

Facial tics are perhaps commonest of all, and often are cast in the mould of the mimic expressions. Blinking, winking, licking, biting, nibbling, pouting, smiling, grinning tics—all these are usual enough. Absurd they frequently are, and even liable to lead to misunderstanding, as in the case of an old lady who embellished a serious narration of her son's illness by constantly winking her left eye and immediately afterwards protruding her tongue. Tics of the neck and head are also very common—nodding, rolling, shaking, tossing head movements, tics of affirmation and negation, bowing and salutation tics. The salaam movement reaches its height in the mentally defective, and as it contains a rhythmic element foreign to most ordinary tics, it does not quite come into this category. With neck tics are frequently associated shrugging and other tics of the shoulders.

Tics involving the trunk musculature are not, in my experience, so uncommon as is supposed.

In one case more or less constant, irregular contractions of the recti abdominis led to considerable hypertrophy. They could be inhibited for a short time by an effort of the will, and disappeared on a deep inspiration, always becoming more pronounced as volitional movement came to an end.

Protean tics of arms and hands are seen—scratching, rubbing, scraping, stroking, tapping, beating, pounding, pulling, pressing tics. A psychasthenic patient incessantly ran his fingers through the hair over and behind his left ear; a girl was for ever brushing an imaginary fly off her face.

Tics of the lower extremities are, on the whole, not very common, but leaping, jumping, kicking, and other interferences with walking rhythm are described. Some of the walking tics are peculiarly complex. Genuflexion tics are not rare.

Tics of the respiratory and articulatory apparatus are extremely frequent; snoring, sniffing, blowing, grunting, snorting, whistling, coughing, sobbing, hiccuping tics all occur. Actual tics of speech are met with. Conformably to our definition, we cannot consider stammering as a tic; it occurs only when speech is intentionally commenced; the tic of speech is constituted by the escape of words or phrases, irresistibly and unexpectedly, at moments of silence. (See the next paragraph.)

The *maladie des tics convulsifs* of Gilles de la Tourette is characterized by progressive evolution of multiple tics, eventual development of echolalia and coprolalia, and an unsatisfactory prognosis. Whether the syndrome should be regarded as a clinical entity is open to considerable doubt; coprolalia has been seen in individuals not exhibiting any variety of tic, while many severe tic cases are unaccompanied either by it or by echolalia. The latter, moreover, occurs with other symptoms in a special form of aphasic disorder (so-called

'transcortical sensory aphasia'). Yet a fair number of cases conforming to Tourette's original description are on record, exhibiting in particular that progressive evolution on which he laid stress, and that eventual generalization of convulsive movements which may be regarded as the tic's apogee. Further, this development not infrequently culminates in actual insanity. The majority of reported instances are characterized by the onset of tic movements in early years, the additional clinical features following much later, and by the practically constant component of a wretched family history of mental instability and degeneration.

I have seen one striking example, in a girl of 20, with head, face, neck, and arm tics, whose symptoms began at the age of 8, who repeats "b——y s—d" *ad lib.*, in a low monotone, or interlards her conversation with an explosive "d——d b——r," repeated three times rapidly; echolalic also, and afflicted with a *délire de toucher*, she has become socially impossible, as evidenced by the fact of her being reported to the police by her neighbours.

In no clinical class are tics more rampant than in idiots and mental defectives of all sorts; they assume frequently a highly complex and elaborate character, such as balancing, whirling, dancing, rocking, rumping, self-striking, -beating, or -pounding (so-called krouomania), and so forth.

3. *Tic-like Movements following Epidemic Encephalitis.*

It is convenient here to allude in passing to the development of tics apparently on a basis of previous encephalitis. In the course of the last few years many examples of somewhat elaborate involuntary movements, exhibiting the tic-like characters of irresistibility, repetition, 'convulsive' or clonic manifestation, rapidity and exaggeration, have come under notice in the subjects of epidemic encephalitis; ranging in degree from a very simple motor reaction, belonging rather to the group of spasm or of myoclonus, to one of much complexity and extensity, it becomes a matter of no little difficulty to assign them a nosographical position. For example, the numerous disorders of the respiratory mechanism (using the term in its widest sense) which every neurologist has seen, might be reckoned with the tics in possibly a majority of instances, yet others are apt to overflow into intricate manifestations somewhat closely resembling lowest level fits. Other varieties, especially such as embody movements largely of the torticollic kind, recall the picture of tics as ordinarily understood.

So many instances have come under notice that it seems superfluous to illustrate, but I may cite one case, that of a boy of 10, who ever since his encephalitis died down has suffered from a sudden, rapid, torticollic movement to the right, at the same moment lifting his eyebrows and opening his mouth; if unusually severe, an abrupt elevation of the right shoulder and movement backward of the right arm accompanies it. It has persisted unchanged for three years.

Explanation of the genesis of these and similar motor phenomena of a postencephalitic kind is beset with difficulties, and, while it is natural to attribute them to the disease, we must not lose sight of the psychopathic soil in which they may be sprouting, for they are neither universal nor invariable as a sequela ; and it is equally certain they do not all pass comfortably into the category of tics.

ETIOLOGY AND PATHOGENESIS.

(1) Behind all tic phenomena lies a *psychical predisposition*. In their classical treatise Meige and Feindel were resolute in their reference of tic pathogenesis to a mental process, and in their differentiation of it from muscular spasm effected by sensory or motor excitation on a reflex arc. Later observers have done no more than substantiate this general conclusion. The common association of tics with mental defect and imbecility, with such psychoses as paranoia and schizophrenia, with katatonic states, and, more widely, with mentalities of an unstable quality, effectually precludes any other view. A varying degree of mental infantilism, as already mentioned, stigmatizes the tiqueur ; in the language of psychoanalysis, he is narcissistically fixed (Ferenczi).

(2) Grafted on a constitutional basis, tic makes its appearance in some cases (possibly in the majority) as the expression or outward manifestation of an *unconscious desire*—or better, as I am fully convinced, of a desire that is often but half-hidden from consciousness. In respect of actual hysteria, my experience confirms that of Meige and of Cruchet, that tics rarely accompany that psychoneurosis, yet in its egocentricity and its failure to govern the emotions the temperament of the tiqueur undoubtedly recalls that of the hysteric. From the psychoanalytic viewpoint, as sketched by Ferenczi, tic formation is facilitated by a need or desire to draw attention and feeling to certain parts of the body which belong to the group of erotogenic zones, and by their " genitalization " (excitation, tendency to rhythmical movement) through the tic satisfaction is obtained. Regarded as a form of autoeroticism, tic by no means always assumes such fairly definite qualities, and the stimuli arousing it, especially in the constitutional narcissist, can be of a more incidental or less specific character.

Experience leads me to emphasize the feature of *seeking a pleasurable sensation* in the genesis of innumerable tics. If the normal individual finds it hard to prevent his tongue exploring the edge of a loose tooth or the space left by a recent extraction, how much harder is it for the potential tiqueur to relinquish the particular movement whose execution awakens some " sweet " or even " bitter-sweet " sensation. No one who watches a tic in the making can fail to be impressed by this incessant search for the pleasure-giving feeling in many clinical instances, and it explains largely the vast group of complex semi-rhythmical tics in those of low mental calibre. Mere repetition, however, mere habit-mongering, does not constitute its subject a tiqueur ; to the

repetitive element must be added a pathological component comprising defective inhibition and an abnormal susceptibility to stimuli heavily charged with pleasurable feeling-tone. As Charcot said, not all who would may tic.

(3) Any purposive co-ordinated act passes by dint of *repetition* into a *habit*, an acquired automatism ; nor does its character of necessity change if its *raison d'être* disappears. Should the now purposeless habit assume an exaggerated form and a haphazard incidence, it has degenerated into a tic. Cortical activity initiates the embryonic tic ; cortical intervention determines its continuance when removal or disappearance of the cause would otherwise occasion its death from inanition. Once this state in its turn is passed, the motor phenomena persist independently of volition. In many commonplace tics no more recondite origin than this can be traced ; no conscious pleasurable element accompanies them, still less any suggestion of a hidden sexual conflict between the ego and repression. Not a few of the simple and limited tics of youthful subjects arise in this fashion : making faces across the nursery table in a wet-day competition, experimentation with the phonatory capacities of the larynx, visual or auditory mimicry of the habits of others, are exemplars of the initiatory mechanisms for habit-tic formation. In a sense, these habits constitute a kind of reflex cortical activity, and illustrate the escape of function of cortical arcs.

(4) Once more, *movements of defence* against a source of irritation suffice in some instances to set in motion the processes leading to tic. By way of ridding the organism of a local irritant or annoyance the predisposed individual will be found to have in due course elaborated a reaction disproportionately calculated to produce that effect. A pathogenesis of this kind is responsible for numerous uncomplicated and monosymptomatic varieties (sniffing, clearing the throat, and so on). I well remember a curious case of spasmodic torticollis in which the incessant movement of the patient's arm to hold his head straight eventually itself changed into a tic, and persisted after operation effected a cure of the neck condition.

(5) Finally, I must direct attention to the possibility of a tic being engendered on the basis of *pre-existing involuntary movements* of another class, of which the passing of choreic into tic reactions is probably the best known example. To determine when a choreic gesture becomes perpetuated as a tic by alteration of its pathogeny can scarcely be an easy matter, but of the genuineness of the transformation in certain clinical cases there is no room for doubt. The role played by volition therein consists of the temporary reproduction of the choreic movement after the disappearance of the organic basis on which at first it is erected ; given an appropriate cortical instability, the stage of habit rapidly blends with that of tic formation.

Whatever be the precise pathogenesis in a given case, the motor reaction, simple or composite, exhibits a tendency to increasing physiological isolation and descends to the level of a meaningless automatism ; a deeply ingrained pattern, its momentary inhibition by a cortical effort merely emphasizes its

independent existence as a cortical reflex—in this sense, therefore, ultimately allied to spasm—which lives a life of and on its own. Yet it is not, as a fact, as completely independent as might appear. Devoid of meaning, as empty as many swear words repeated absentmindedly, the tic cannot be dissociated in any absolute sense from the influence of other cerebral (intellectual or emotional) activities. An element of apprehension or fear seems to be an important factor in not a few instances, and the emotion tends to excite the tic as a sort of fear psychosis. Where the circumstances are such as to render it desirable the tiqueur should not " make an exhibition of himself," anxiety and apprehension lead to the very explosion that he would avoid. Consciousness that he can be seen or heard acts as an excitant.

PROGNOSIS AND TREATMENT.

Prognosis is dependent on the degree of volitional impairment of the patient. In children some tics are purely transient and never recur ; in some adults persistent treatment may certainly effect a cure. On the whole I have seen fair results in the majority that have been under my care. The older the patient, and his tics, the less favourable are the chances of relief. In any case the adoption of an encouraging attitude and confident demeanour will go far to give the physician that start in the fight which is half the battle.

Relapses are unfortunately anything but rare, for the predisposition remains though its expression in a given tic may be checked. The life-history of Meige and Feindel's patient O.—one unending series of new tics for old—is as depressing therapeutically as it is entertaining clinically. No prognostic significance attaches to the simplicity, complexity, or multiplicity of the tics in a given case ; it is the patient's volition which counts.

1. *General Hygienic Measures.*—Many tiqueurs require management as much as treatment. Only too sensitive to their infirmity, after a time they relinquish hope and sink into an unhealthy valetudinarianism. Give such patients an aim in life, side-step their self-consciousness by assigning some daily task, congenial and not fatiguing, and they may work out their own salvation. The association of fond parents and a spoilt child is too frequent an antecedent to the development of tic in the latter to be a mere coincidence. Sometimes one glance at the mother or father of the youthful tiqueur suffices to explain all. In such an atmosphere the patient stands little chance of material improvement, hence change of environment must be stipulated for unhesitatingly. Further, much can be done by disciplinary régime calculated to recreate or develop his self-control in matters not directly concerning his tic, thus exercising an indirect effect on it. Apart, however, from general supervision and regulation of the patient's mode of life, simple hygienic measures should be undertaken in cases where tics reach their maximum when he is ' run down.' Further, simple and obvious though the tic or tics are, the physician cannot afford to dispense with a careful routine examination of teeth, throat, ears, eyes, nose, etc., according to the localization, nor should the question of clothing and headgear be overlooked.

2. I am far from depreciating the good every now and then obtained in cases of tic by general *sedative medicinal treatment*. Many cases in out-patient practice have undoubtedly been benefited by a course of bromides in comparatively small doses, administered over a considerable time. It should be remembered that the association of tic and epilepsy is not infrequent, and the possibility of their symptoms being to some extent interchangeable not to be ignored. Further, success achieved in this way may not always be attributable merely to suggestion. The effect of bromide on pavor nocturnus, on convulsive and spasmophilic conditions generally, on the motor restlessness of some forms of idiocy, and so on, warrants its occasional application in cases of tic where the pathological habit is so engrained in the nervous system as to have shed altogether its psychical element. Isolation of the patient after the Weir Mitchell fashion is not as a rule advisable. Many hail the chance of seclusion with equanimity, and tic away behind screens to their heart's content.

3. A fair number of cases are on record in which *hypnotic* or other *suggestion treatment* proved beneficial; my own experience has not been reassuring. The best results have been obtained in hysterical cases, and such are undoubtedly rare, as we have seen. The methods of psychoanalysis serve in some instances, and enduring results have been occasionally claimed, but in my experience psychological technique generally is of no great avail. Tic may be, in some instances, a form of conversion hysteria, but in the great majority of cases the origin of the symptom does not lie in the realm of the unconscious.

4. *Treatment by Re-education.*—The principle of treating tic by muscular drill—a method known to the French school for the better part of a century—has thoroughly justified the confidence that has been reposed in it. Brissaud's scheme is a combination of "immobilization of movements" with "movements of immobilization." As an illustration of the former procedure the patient is first of all required to sit still, literally, for as long a time as possible. In a bad case this may not extend beyond a second or two; nevertheless these seconds are seized, and after an interval of a minute a fresh attempt is made. Perhaps by an effort he will now keep still for several seconds—say ten. Treatment is carried out with rigid regularity at certain hours, three or four or five times a day; all efforts are timed, and in the presence of and under the encouragement of the physician every endeavour is made to prolong the actual duration of successive séances of immobilization. By gentle gradations each day the seconds will be found to grow into minutes and the minutes into hours. Once the patient's intelligent co-operation is successfully elicited, it is advisable to vary the attitude of immobility which he adopts. Special attention must be directed to the musculature involved in the tic, with this object ever in view—namely, to increase the degree of volitional control over the rebellious muscles.

The reverse of this method of procedure is actually to make the patient innervate the tic groups, but in ways contrary to those executed involuntarily.

If the arm is involved, say, then the patient is taught to perform slow regular movements with the arm, with the utmost deliberation. Although, as will happen, the tic every now and then intervenes, he nevertheless perseveres, simply for a minute or two at a time, always avoiding fatigue, three or four or five times a day. If the face is the seat of the mischief, he is made to innervate the facial groups individually, by whistling, showing the teeth, closing the eyes, wrinkling the forehead, pouting the lips, blowing out the cheeks, etc., always deliberately and according to schedule, but only for a minute or two to begin with. Thus from day to day the patient is encouraged to find that he is executing voluntarily what he thought had passed beyond his control, and is correspondingly elated.

It is a good plan to see that the programme is carried out in front of a mirror. By this simple means the patient can judge of the degree of control obtained, and visual stimuli can be utilized to strengthen his will.

In addition to exercises of the above sort, for individual tics, another method of re-educating the patient's will is to utilize respiratory exercises, as advocated more especially by Pitres, Cruchet, and others. With a deep and regular respiratory rhythm tics tend to diminish or die away. The patient is placed upright against some support, his heels together and his arms by his side. He then makes a series of deep inspirations and expirations, elevating his arms synchronously with the former, and depressing them with the latter. The exercises may advantageously be repeated every three hours to begin with, then their duration may be increased and the intervals lengthened, until the séances are extended to fifteen minutes three times a day. Respiratory drill may be carried out as the patient lies full length on the floor.

Still another form of general exercise has been called by Meige and Feindel "mirror drill." This has no reference to performances in front of a looking-glass, but signifies the simultaneous employment of bilateral identical muscular groups in the execution of various prescribed movements. It takes advantage of the physiological fact that the simultaneous contraction of two symmetrical muscles is more readily attained than that of two asymmetrical muscles. The physician should set the patient daily exercises in writing, drawing, tracing, and so on, the unaffected limb leading, and the other following simultaneously. The movements may be made simply in the air, or on a wall, or on paper, as is found convenient. The method is obviously elastic, and this is one of its great advantages. Its essence is the re-education of the uncontrolled limb by its synchronous innervation with the limb over which the patient still has good voluntary control.

Finally, a technique practised with success by Oppenheim is directed to strengthening the tiqueur's power of inhibition by insistence on his checking his reflex responses to threatening movements or to painful stimuli, for which purpose the tickling reflex, the eyelid reflex, etc., are utilized. This sort of inhibition gymnastic deserves trial in inveterate cases.

II.—Professor G. GUILLAIN, Paris.

I consider there is little to add to the clear and complete exposition of the opener of this discussion, and I propose to confine my observations to spasmodic torticollis.

Twenty-five years ago, when Brissaud and Meige called attention to spasmodic torticollis, nearly all neurologists admitted its functional origin. Since 1902, however, both Professor Pierre Marie and I have failed to be impressed with the applicability of the psychogenic theory in many cases. We have seen torticollis exist with definite pyramidal syndromes, and also in association with organic familial spastic paraplegia. More recently, with my assistant, Dr. Thérénard, I have observed numerous cases of the condition in patients suffering from postencephalitic disorders, and occasionally as the only result of a mild encephalitis. From the point of view of general etiology it is interesting to note that hyperkinesis and disorders of posture, seen after epidemic encephalitis, present certain characteristics resembling those of functional or hysterical affections. Torticollis, glossolabial spasm, and so forth, may resemble those which have a hysterical basis. In several cases of torticollis following encephalitis I have noticed the occurrence of Brissaud's "antagonistic gesture," to all appearance as irrational and paradoxical as in hysterical states. This imitation, however, does not allow us to conclude, any more than eventual improvement by psychotherapeutic methods, that the origin of such manifestations is in the mental sphere.

It is undeniable that emotion can exaggerate or modify postencephalitic dyskinesias, just as it can and does exaggerate many organic conditions, such as pyramidal and cerebellar syndromes. It has appeared to me, further, that the modifying effect of psychotherapy on various postencephalitic syndromes resembling clonic or tonic tics has been very slight, nor have I ever observed, in postencephalitic cases, any example of contagion or imitation. Further, in such cases I have never been able to obtain evidence of the existence of the essential mental constitution peculiar to tiqueurs. I consider that the functional element is of little importance in postencephalitic syndromes; the predominating feature is disorder of the tonic mechanisms of attitude or of simple motor automatisms.

III.—Professor RÉNÉ CRUCHET, Bordeaux.

I agree with Dr. Kinnier Wilson as to the necessity for putting some order into the existing confusion of involuntary movements. This I[1] tried to do as long ago as 1901-2, and I am grateful to him for having quoted my views on this subject and especially for his ingenious endeavour to correlate them with those of Meige and Feindel.

The opinion that a tic, to be a tic, must be clonic is not a specific French idea, since Sir Charles Bell,[2] in 1830, in his famous work, used the term "spasmodic twitching" which is equivalent to tic. Marshall Hall,[3] in 1852, also

described "muscular tic," and gave examples of several types, *e.g.*, violent frowning and winking, nasal tic, rolling of the tongue, continual and violent grinding of the teeth, distortion of the face, protrusion of the chin to one side, shaking of the head, biting of the nails. One person hitched up the trousers continually; another pressed the knuckle of the forefinger on the upper teeth until a corn formed upon it.

To show the importance of the clonic movement of tic, Marshall Hall added: "There is another form of muscular condition, which consists, not in *tic* or movement, but in *constant* contraction, voluntary in its essence. This affection obtains in some cases of paralysis agitans; the hand is perpetually closed, the arms rigid, and when the patient rises from his seat, it is without movement or flexion at the various joints. He is all 'of one piece' as it were. Yet there *is the power* of opening the hand, flexing the limbs, etc., that is, of relaxing the muscular effort which bound his limbs in rigidity."

In 1899 Risien Russell[4] also compared a tic to a twitch or jerk. This is a clinical truth, which still remains; if I ask any member of my audience to reproduce a tic, he, I am sure, will not hesitate one second in making a rapid winking, some violent shrugging of the shoulders, or some frightful face.

Tic is a movement of action. It must not be confused with an attitude, which is a fixed movement, "in constant contraction," as Marshall Hall said. That is why the term 'tic' is not appropriate for spasmodic torticollis, because the torticollis evokes the idea of a more or less permanent attitude. The 'tonic tic' of Meige and Feindel does not mean anything to me, because tic is a short or sudden movement, that is to say the contrary of a tonic movement, which objectively corresponds to a fixed movement.

I know very well, indeed, as Kinnier Wilson says, that from rapid, quick and clonic movement one can insensibly arrive at tonic and slow movement, and even reach the absence of movement. But the engine of my motor car can also go very quickly or very slowly, with all gradations of speed, from the most exaggerated to a complete stop. However, the speed and the stopping are two terms entirely opposed, just as the terms 'tic' and 'attitude.' That is why I maintain that these words must be clinically separated.

However, if these two varieties of phenomena are objectively different, they have, at the same time, some common characters. Attitudes, as well as tics, can repeat themselves in an involuntary, intermittent and absurd manner at irregular intervals, with a variable intensity and an exaggerated frequency. Their execution is imperious and irresistible, because the subject cannot stop them; he can delay them for a certain time by a violent voluntary effort, but they always get the better of the will.

Attention, rhythmic respiratory exercises, horizontal decubitus, presence of the doctor, public places, attenuate tics and can stop them temporarily. I have kept tiqueurs in my consultation-room for more than an hour without having seen a single tic. All acts of ordinary life during their execution cause tics to cease; the subjects can eat and drink, dress themselves, do their hair,

speak, pick up a pin, write, etc., with perfect ease. One of my patients, a hairdresser, a great tiqueur, shaved his customers with consummate cleverness. An artist of Bordeaux painted on canvas with particular care; then, all at once, when his tics became irresistible, he made violent strokes with his brush on another canvas placed by precaution next to the first one; when the riot of tic movements ceased he began to paint again with perfect calm.

MENTAL STATE.

It is easy to observe in a great number of tiqueurs an abnormal mental state characterised by mental infantilism instability of ideas, inconstancy, carelessness, absence of will, impulsiveness, excessive emotivity, capricious affectivity, disorderly imagination, and loss of deliberation and judgment. On the contrary, some other tiqueurs are extremely intelligent and possess a strong will. Others again, belong to the mental group of those with obsessions and fixed ideas. Several of my tiqueurs cannot go into their rooms without touching the handle of the door three or four times; they cannot get into their bed without looking underneath it. One of them, as soon as he had a minute to spare, used to brush himself in getting up, going to school, coming home, before and after meals, and before going to bed, so that his clothes might be clean for the next morning. Certain tiqueurs exhibit neither mental heredity nor personal mental defect. I do not believe that a "habit-illness" is always a cause, for in certain cases tics are not executed in spite of the will of the patient, but quite independently of it; he is as it were the spectator of them. The power of the will seems normal, yet incapable of restraining mental disorder.

One may compare this condition to that which occurs in the fixed state of postencephalitic Parkinsonism. At the beginning of an act the Parkinsonisn subject can execute his movements normally, but little by little the will loses its effect, although local muscular resistance does not exist. The same applies to tiqueurs; the will can restrain muscular activity for a certain period, but its action lasts only for a short time, and the tics return. In both cases, the will is normal, but its action is as insufficient to reduce the fixed Parkinsonian state as to prevent the explosion of tic. The trouble is evidently of cerebral origin, but it is not necessarily a mental one.

TICS IN EPIDEMIC ENCEPHALITIS.

Most tics described by writers on epidemic encephalitis are not true tics. I believe, with Kinnier Wilson, that they should be placed in the group of 'spasm' or of 'myoclonus.' In particular, most of the respiratory postencephalitic muscular disorders are spasms and not tics. Nor are postencephalitic ocular spasms to be confounded with tics. These various spasms occur in attacks during which the action of the will is reduced practically to *nil*. Further, the cases of postencephalitic spasmodic torticollis which I have observed were all examples of spasm, and not tics. They belong to the group of 'diffuse spasmodic torticollis,' just as I[5] described them in 1907. Then, I had already noticed the occurrence of Brissaud-Meige's 'efficacious

antagonistic gesture ' in spasmodic states and without a mental origin. The same gesture I have seen recently, in several cases of torticollis following epidemic encephalomyelitis.

An opinion I[6] expressed in 1917, and now generally admitted, is that the mental sequelæ of this affection are specially frequent in childhood ; to quote my[7] statement in 1920 : " Children become unstable, agitated, tiqueurs, impulsive, almost dangerous ; one cannot keep them in normal schools, where they create disorder and learn badly, not only on account of their instability but also owing to the poorness of their memory." In cases where encephalitis provokes by its diffusion mental disorders and spasmodic reactions, it is very difficult to separate the mental from the spasmodic cause. Tics, however, are fairly easily distinguished.

TREATMENT.

As Kinnier Wilson has said, modern treatment has considerably improved the prognosis of tics. Marshall Hall said : " I have rarely known these tics to disappear." And he added : " It is a great question whether any notice should be taken of these tics ; or whether they should be left to wear themselves out, if that event may be hoped for."

In general, one must remove tiqueurs, especially if children, from their environment. I always advise parents to allow me to admit the child into my hospital *service* for nervous and abnormal children at Bouscat, near Bordeaux, for a month or two. They are subjected to a maternal but firm discipline, and the moral effect of this medicopedagogic education is, I believe, quite essential. To cure a tiqueur it is necessary to follow the same medical rules as to cure a stammerer.

I do not disapprove of medical treatment ; I allow antipyrin, potassium-boro-tartrate, gardenal, and occasionally bromide.

I remain faithful to respiratory gymnastics, which Pitres and I have long advocated.[1] It is especially successful in children, for it has a more automatic effect than Brissaud's scheme : it acts less on the will, which is always unstable and difficult to control. In some cases of tics with obsession, I have obtained good results by suggestion in normal or in prenarcotic sleep. It is indispensable to prevent complete narcosis ; one must leave the patient in the twilight-sleep which precedes the sleep of complete anæsthesia. This treatment has also been applied with success in certain persistent tics of the eyes which are frequently mistaken for epileptic spasms.

REFERENCES.

[1] CRUCHET, R., " Étude critique sur le tic convulsif et son traitement gymnastique," *Thèse de Bordeaux*, 1901–1902.

[2] BELL, CHARLES, *The Nervous System of the Human Body*, London, 1830.

[3] HALL, MARSHALL, " On Muscular ' Tic,' " *The Lancet*, 1852, ii, 510.

[4] RUSSELL, J. S. RISIEN, " The Tics," *Allbutt's System of Medicine*, London, 1899, vii, 868–71.

[5] CRUCHET, R., *Traité des Torticolis Spasmodiques*, Paris, 1907.

[6] Cruchet, R., Moutier and Calmettes, "Quarante cas d'encéphalomyélite subaigue," *Soc. Med. Bordelais*, April 27, 1917.

[7] Cruchet, R., "L'encéphalomyélite à Bordeaux et dans les régions voisines," *Soc. de Méd. et de Chir. de Bordeaux*, 10 December, 1920.

DISCUSSION.

Dr. A. F. Hurst, Ascot.—I agree with Professor Guillain that torticollis has frequently an organic basis. The worst case of spasmodic torticollis I have seen followed an attack of malaria and lasted three years; when the malaria relapsed, the torticollis disappeared. In severe cases the therapeutic effect of malarial infection might possibly be worthy of trial.

The question of visceral tics deserves a little attention. Aerophagy or air-swallowing is thought to be associated with flatulence, but in cases which I have seen there has been normal acidity and normal motility of the stomach, and fermentation or flatulence has been entirely non-existent. Owing to the alleged flatulence the patient attempts to relieve his epigastric discomfort with repetitions of belching, which result merely in the swallowing of more air. Simple explanation and persuasion in most cases results in cure.

Tics of coughing also occur, especially in association with asthma. A frothy expectoration accompanied by cough in this condition is always a symptom of a tic-like character.

Dr. B. Sachs, New York.—No one can be expected to add much to the opening paper. Tic is, after all, a generic term. There are many tics and many causes, and their frequent psychogenic basis is significant, as is the association of mental instability with tics. Yet in many instances of ordinary kinds of tic no marked mental disturbance is discoverable. Typical examples of Gilles de la Tourette's disease are distinctly rare, though tricks and tics of speech are common. Echolalia and coprolalia are in my experience always associated with marked psychical disorders, and are, therefore, different from ordinary tics.

It is important to trace the cause or causes that lead to the beginning of those disordered and impulsive movements. So many begin in early life that it is essential to attack them at that period. Many a tic that has been carried all through life might have been checked if at its beginning the physician had been a severe disciplinarian. Kindly but firmly the youthful tiqueur has to be told that the tic must stop, and that he is the one to stop it, with such further assistance as the neurologist may suggest.

Dr. Stanley Barnes, Birmingham.—In my experience only those of a nervous temperament, mainly inherited, are liable to tics. I have been struck with the relative frequency of tics in Welsh as contrasted with Anglo-Saxon types, though I agree that no race can be regarded as exempt from them. In respect of treatment, I rely largely upon discipline, with which I occasionally combine a little drug treatment (bromide or hyoscine).

Dr. Grainger Stewart, London.—A tic can arise from a habit either of seeking a pleasurable sensation or of avoiding an unpleasant sensation. On the psychical side, an irresistible desire is usually in being, which becomes

painful if repressed. Apprehension also plays a part; for instance, in grimacing the fear of being seen is apt to increase the severity of the disordered movement. Tics are in no way related to hysteria; indeed, I consider the aerophagy referred to by Dr. Hurst a hysterical manifestation, and not a true tic. The majority, being psychogenic, can be influenced by appropriate treatment; I have had under observation a case in which a tic disappeared following the revival under hypnosis of a forgotten memory. Co-ordinated exercises are of special value in treatment.

Dr. R. G. Gordon, Bath.—The psychogenic factor in the genesis of tic has been duly stressed, but it is well to bear in mind that there may be factors of another series which determine the origin and type of individual tics in the psychopathic person. Torticollis, for example, may be started and maintained by fibrositis of the trapezius muscle, or by arthritis of the shoulder joint. These data are of particular interest from the standpoint of treatment, and in undertaking this it is necessary to examine the patient carefully for pathological conditions outside the nervous system.

Some of the so-called postencephalitic tics are associated with conduct disorders; in such cases psychotherapeutic treatment has proved of service in improving or abolishing the movements.

Dr. N. D. Royle, New South Wales.—I have sometimes found chronic arthritis of the cervical vertebræ in association with spasmodic torticollis in adults. The afferent side of the reflex movement arises from this local condition.

Dr. A. J. Brock, Edinburgh.—I agree fundamentally with the disciplinarian method treatment, but think that less emphasis should be laid on the individual symptom and more attention given to a hardening, as it were, of the underlying psychical asthenia.

Dr. P. C. Cloake, Birmingham.—It is of great importance to realise that closely similar movements may arise from disorder of neural mechanisms at very different levels, and that etiological differences are of prime importance in determining the line of treatment to be followed. This is true not only of tics but of various other neurological conditions, and, I believe, also of the respiratory sequelæ of epidemic encephalitis, which may in one case have their origin in rigidity of the chest wall and in another in brain lesions at various levels. A view of this kind allows a conception of disordered behaviour which is not interrupted by any distinction as between physiogenic and psychogenic. At the highest levels disorders of function manifest themselves as psychical disorders, and correlated physiological and anatomical changes may be unrecognisable. In the psyche, too, there are levels of function, and ample opportunity for other psychical motivations than that of seeking a pleasurable sensation.

Disciplinarian treatment is not synonymous with 'brow-beating'; the latter amounts simply to overcoming the unrecognised motives of tic by the stronger motive of fear or shame, and in the long run may do more harm than good.

OBSERVATIONS AND RESULTS FROM INTRACRANIAL SECTION OF THE GLOSSOPHARYNGEUS AND VAGUS NERVES IN MAN.

By TEMPLE FAY,* Philadelphia.

The exact function of the glossopharyngeus and vagus nerves in man, especially as to their sensory values, has not as yet been definitely established. These two nerves are so intimately connected at their origin in the medulla oblongata, and after their exit from the jugular foramen, that experimental physiology has not as yet succeeded in isolating the functions of each. Pathological conditions frequently affect both of these structures simultaneously, not only in their central but also in their peripheral relations, giving rise to uncertain conclusions.

The observations noted in this paper have been derived from two cases; one in which the *intracranial root* of the ninth nerve was sectioned alone, at a point where its true components are assembled to compose the root, and are therefore the expression of the actual function of this nerve itself, before anastomotic fibres have been added from the neighbouring vagus. In another case, the *intracranial root* of the vagus was sectioned alone and its manifestations studied.

This paper affords the opportunity of confirming in the human being the sensory determinations established by Sherrington[1] in the macaque. In fact, the means of study has been strikingly similar to his own by the use of residual areas of sensation after destruction of the adjoining sensory fields.

I have been unable to find any similar cases relating to man, where sensory studies have been made after careful section of the intracranial roots of the ninth and tenth nerves, with obliteration of the adjoining sensory fields also, by destruction of the posterior roots involved. I believe this to be the first presentation of sensory studies after isolated intracranial section of the glossopharyngeal and vagus roots in man, in this manner.

Heretofore information as to their function has been derived chiefly from pathological lesions situated near these two structures, but their separate functions have not been definitely established. Oppenheim[2] states regarding the glossopharyngeal: "affections limited to this nerve have practically never been observed, and the vagueness which obtains as to its physiological position and its functions has not hitherto been elucidated by pathology. So far as I am aware, an injury limited to this nerve has not yet been observed." In

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speaking of the vagus he states : " it is usually affected in common with other cranial nerves, especially with the glossopharyngeal, accessory and hypoglossal."

Although an abundance of observations exists regarding extracranial involvement of these two structures, especially the vagus (Hirsch, Oppenheim, Kohnstamm, Lemon) by pathological processes and intracranial root involvement (Weisenburg[3]) as well as experimental evidence (Kriedl, Kohnstamm, Sherrington, Grabower), combined with surgical extracranial section (Sicard, Robineau, Adson), exact information regarding the part assumed by each of these nerves has not been definitely demonstrable. The reason for this uncertainty is evident from the intimacy of the structures as they enter the jugular foramen and pursue their early extracranial course. Individual involvement, except by careful surgical selection, is almost impossible.

Figure 1 diagrammatically represents the relations and connections of these nerves as they leave the medulla and progress toward their peripheral destinations. Their communications and branches have been faithfully

FIG. 1.

Diagrammatic reconstruction of the seventh, ninth, tenth and eleventh cranial nerves showing their intercommunications and the general distribution of their many peripheral branches. Accurate determination of the functions of each is only possible by section of the intracranial root, because of the addition of new fibres from one to another in their extracranial relations.

recorded from anatomical authorities such as Spalteholz, Piersol, Pitres and Testut[6], Zander[7], and others. Anatomical relations in this diagram have not been maintained because of their complexity.

It is at once evident that section or destruction of either of these nerves, extracranially, produces an impure and misleading result because of a large branch given off from the vagus to the glossopharyngeal within the jugular foramen. The only certain means of determination lies in the careful selection of the roots as they emerge from the medulla to compose the intracranial portion of the root and thus represent the individual function of each. This has been possible because of the rapid advance of neurosurgery and the technique devised by Adson[8]. It has been undertaken to relieve the extreme pain encountered in cases of metastatic carcinoma of the mouth and neck.

INTRACRANIAL SECTION OF THE GLOSSOPHARYNGEUS.

The case (E.B.) is unique in the following respects: (1) Isolation and section of the ninth nerve intracranially, without disturbing any fibres of the tenth or eleventh; (2) cervical rhizotomy of the second and third posterior cervical roots so as to produce an adjacent anæsthesia of the head and neck; (3) section of the posterior root of the fifth, so as to produce an adjacent anæsthesia of the face and forehead.

CASE 1. Mrs. E. B., age 41. Admitted to the Neurosurgical service of the Episcopal Hospital, March 25, 1926. Referred by Dr. Eugene Pendergrass.

Diagnosis. Carcinoma at the base of the tongue on the left, with metastasis to the anterior cervical lymphatics.

Chief complaint: Severe pain in the region of the left ear, behind the ear, and extending to the vertex. Pain deep in the throat, greatly aggravated by eating and swallowing. Pain at times confined to the lower jaw and tongue; only slight relief of pain even from large doses of morphine.

Operation: March 27, 1926. Cervical rhizotomy and intracranial section of the glossopharyngeus on the left (Dr. Fay). Recovery, with relief of all pain *excepting* that confined to the throat and ear.

Operation: June 26, 1926. Section of the posterior root of the trigeminus, on the left (Dr. Fay). Recovery. Pain in the throat and ear not relieved.

The result of the first operation (Fig. 2) was to produce only the same anæsthesia which I[9] have observed in other cases of cervical rhizotomy.

There was no demonstrable change in the area of anæsthesia as a result of section of the ninth nerve, as well as the upper two cervical roots (C2 and C3). The zone of sensory supply attributable to the upper cervical posterior roots as determined in a series of five cases by Spiller and myself[10] showed slight disturbance of pain perception as far forward as the hair line of the forehead, an overlap of one half the area of the first division of the trigeminus. The extension from below over the angle of the jaw invaded the field of the third division of the fifth, and showed some slight disturbance of pain sense to the border of the second division. The distribution of pain sense was found to correspond more closely to the segmental pattern. The second cervical posterior root (the first is rarely present in man and when found quite small) was found

to overlap the trigeminal field and closely followed in its anterior limits the hair-bearing portion of the scalp and bearded area of the face, the posterior border overlapping into the field of the third cervical root.

Our findings are in close accord with Sherrington's[1] on the ape, and the anatomical dissections of Zander[7].

The third cervical root zone shows a generous overlap from the fourth below extending for tactile sense as high as the angle of the jaw. The overlap for temperature is not as great as for light touch, and the overlap for pain is quite limited.

The region of the ear is of extreme interest. The auricle receives a quadruple sensory supply, and if the claims of some observers for the seventh and the ninth be accepted, there would be no less than six separate supplies for this structure. The *trigeminus* supplies the tragus, crus helicis, the anterior border of the helix and the anterior wall of the external auditory canal. This relationship has been carefully determined by Cushing[11], Pegler[12], and many others, and corresponds to the findings in the above case. The *ramus auricularis nervi vagi*, demonstrated by Arnold, whose confines were established by Sherrington (Fig. 6) for the macaque, supplies chiefly the cavum conchæ and the cymba, extending its zone to include the anthelix, the antitragus and a portion of the lobus. The supply also includes a small triangle below and behind the lobe in the fossa anterior to the mastoid, and extending on to the eminentia conchæ posteriorly, a finding which has been constantly present in our[10] series.

The second cervical posterior root.—This supply has not been definitely demonstrated in the human being as no case has appeared where section of the fifth and tenth, and third and fourth cervical roots has permitted the study of the residual areas of anæsthesia. However, the work of Sherrington includes this zone of the external ear in the distribution of the second cervical root and the dissections of Zander[7] and Froesch[13] indicate the presence of these fibres. We[10] have been able to show slight hypalgesia over the posterior aspect of the eminentia scaphæ in the region of the fossa triangularis, as well as along the upper posterior border of the helix, but owing to the extensive overlap no anæsthesia could be demonstrated.

The third cervical posterior root.—When sectioned in conjunction with the second, there appears a definite area of anæsthesia over the helix and the upper posterior aspect of the scapha, and extending into the posterior border of the anthelix (Fig. 3). Our[10] observations have shown that the fourth cervical posterior root sends some fibres to the region of the helix, since after inclusion of this root the area became completely anæsthetic for touch.

It is, therefore, evident in Case 1 that three of the contributing nerve supplies were destroyed, leaving the field of the vagus alone, which retained acutely all forms of sensation in the concha.

Section of the ninth nerve produced no demonstrable sensory change in the remaining field, and, as will be seen in Case 2, ablation of the vagus showed

no demonstrable sensory function attributable to the seventh or ninth, which remained undisturbed (Fig. 5) in this area.

These findings would seem to justify the conclusion in this case that the glossopharyngeal (intracranial root) supplies no cutaneous sensory elements to the region of the ear, face or neck.

I feel, after repeated careful studies, that these observations are convincing as regards the non-participation of the glossopharyngeus in a cutaneous sensory supply.

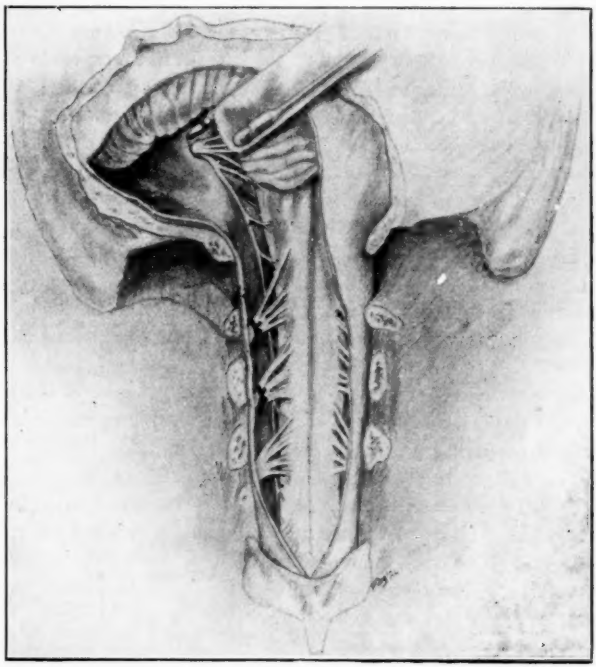

FIG. 2.
Operative approach for intracranial section of the ninth nerve as well as for cervical rhizotomy (undertaken in Case 1). Ninth nerve sectioned at its point of exit and the upper two cervical posterior roots crushed and ligated.

Determination of the sensibility of the pharynx after section of the ninth was striking. No demonstrable change in touch, pain or temperature could be established. Unfortunately this case was complicated by the primary carcinoma of the base of the tongue, involving the region at the base of the tonsil. Observations were difficult (pain in the ear and throat persisting), and definite conclusions must be avoided. The following observations seem justified :

(1) Pressure against the pharyngeal wall and the introduction of a sharp object produced pain. This same reaction was obtained persistently after section of the fifth posterior root, the anæsthesia from this operation including half of the tongue, anterior pillar of the fauces and roof of the mouth, but not the posterior margin of the soft palate.

(2) The 'gag' reflex remained intact.

(3) The motility of the soft palate was impaired by the growth on the left, but there was no added relaxation or loss of alignment.

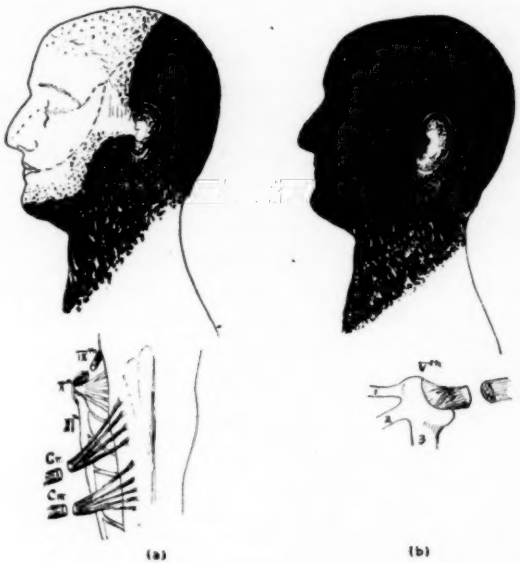

FIG. 3.

(a) Disturbance of sensation produced by the first operation in Case 1. The area includes the dermatomeres of the second and third cervical posterior roots. Note overlap of the fourth cervical root into the area of the third for touch sensation. The field of the second cervical root overlaps the trigeminal area to the hair-line on the forehead and slightly on the cheek, as determined for pain sense by the comparative method. The findings are similar to those in a series of cervical rhizotomies, and there is no demonstrable zone attributable to the ninth.

(b) Field of anæsthesia after second operation, following complete destruction of the posterior root of the trigeminus. Note the residual area of sensation in the region of the ear.

(4) There was no added difficulty in swallowing, or involvement of the swallowing reflex.

(5) The sense of taste on the left, which had been present prior to operation, was lost over the posterior aspect of the tongue, and greatly impaired on

the anterior lateral margin. Salt was recognized but other flavours were not correctly appreciated and were frequently unobserved.

(6) Salivation appeared on the left in increased quantity for several weeks.

(7) The pain complained of in the throat and ear persisted although all pain referred to the tongue, lower jaw, mastoid region and vertex was relieved, and it was possible to maintain the patient comfortably without morphine, by the use of allonal instead.

It would seem justifiable perhaps to assume from these findings that the glossopharyngeus in its intracranial root does not carry sensory fibres to the external ear, nor is there evidence that sensation of the common type is disturbed within the pharynx after its ablation. Its only demonstrable function has to do with the reception of taste impulses and perhaps the regulation of salivary and secretory responses. Whatever sensory fibres appear in the extracranial or peripheral course of the nerve must be added to it from some neighbouring source, undoubtedly chiefly from the vagus.

INTRACRANIAL SECTION OF THE VAGUS NERVE.

The next case presents even more interesting findings. I believe it to be unique from the standpoint of study in the following respects: (1) Subtotal avulsion of the posterior root of the trigeminus; (2) intracranial section of the posterior roots of the vagus.

CASE 2. J. C., age 48. Admitted to the Neurosurgical service of the Episcopal Hospital, October 25, 1926. Referred by Dr. Eugene Pendergrass.

Diagnosis: Carcinoma of the tongue with metastasis to the anterior cervical glands on the left.

Chief complaint: Severe pain in the ear and throat. Pain in the lower jaw and tongue.

Operation: October 29, 1926. Subtotal avulsion of posterior root of the trigeminus, on the left (Dr. Fay). Recovery, with complete relief of pain in the tongue and lower jaw. No relief of pain in the ear and throat.

Operation: November 12. Suboccipital craniectomy, section of vagus roots on the left. Complete relief of all pain in the ear and throat. Paralysis and anæsthesia of the pharynx and vocal cord on the left. Patient, sitting up, died suddenly from inhalation of fluid on the fourth day.

This patient also suffered from carcinoma of the tongue with invasion of the floor of the mouth, and metastasis to the anterior cervical glands. His pain was confined to the throat and ear as in the former case. He also had pain in the third division of the fifth nerve. The first procedure was the subtotal avulsion of the posterior root of the fifth nerve supplying the area of the tongue and jaw involved by pain. It was possible to destroy the root of the third, as well as a portion of the second division, leaving intact the fibres of the first, so as not to endanger the trophic supply to the eye. This method of subtotal resection is that of Frazier.[14] The patient recovered from the operation readily. The pain complained of in his tongue and lower jaw disappeared following the operation, and anæsthesia was demonstrated

in the third and in the lower two-thirds of the second division (Fig. 5). He still complained of the pain in the throat and ear, as in the case reported previously.

Because of the failure in the former case to relieve this type of pain by section of the ninth nerve, it was thought that section of the tenth nerve would bring about relief, in view of the findings in the former case, where after section of the fifth, the ninth and upper cervical roots this type of pain still persisted. It seemed logical, therefore, to attempt intracranial section

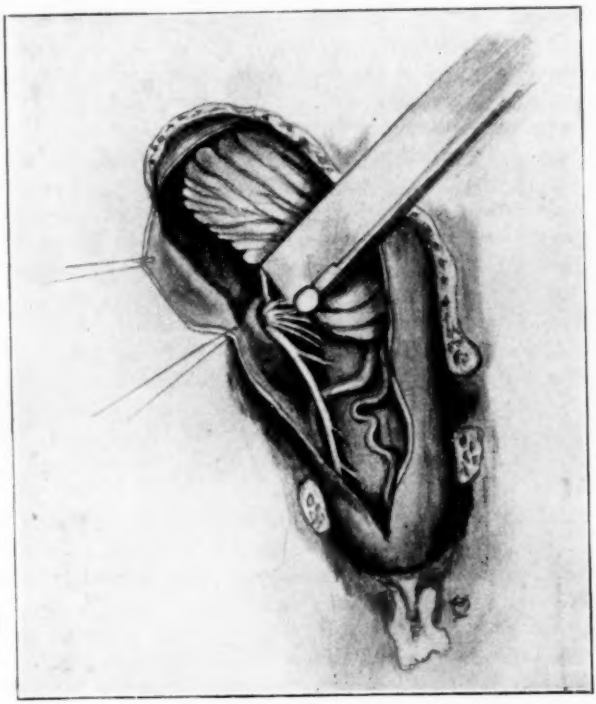

Fig. 4.

Intracranial approach to the vagus through a hemi-suboccipital craniectomy and partial laminectomy. The fan-shaped fibres of the vagus can here be easily distinguished and sectioned at their point of exit without disturbing the ninth or eleventh (Case 2).

of the tenth. Two weeks after the original operation on the posterior root of the fifth an intracranial approach to the vagus was made through the posterior fossa. As in the former case, a suboccipital craniectomy was performed under local anæsthesia, exposing the cerebellum and lifting the cerebellar hemisphere on the side of the pain, exposing the jugular foramen, with the ninth, tenth

and eleventh nerves emerging through it (Fig. 4). Careful selection was made of the tenth fibres only, and these were sectioned. During the sectioning of the vagus on the left side the anæsthetist noted that the pulse dropped to forty. Following section, there was no further evidence of vagus stimulation.

The patient was carefully observed and repeatedly studied immediately after the operation, which was made possible as the operation was performed under local anæsthesia. He was co-operative and showed no evidence of shock. Examinations on the second and third days were most satisfactory.

After carefully determining the area of anæsthesia produced by section of the outer and lower two-thirds of the posterior root of the fifth, it was found that analgesia was complete over the tragus, anterior wall of the internal auditory canal, over the cheek in the third divisional area, and including almost, but not quite, all of the conventional area for the second division. The tactile overlap from the cervical field was slight. Temperature areas conformed closely to pain, though they were slightly less distinct near the periphery (Fig. 5a).

Following section of the vagus root, several observations of extreme importance were made. The cutaneous area of anæsthesia for the ear had enlarged from the base of the tragus and anterior wall of the internal auditory canal to include the posterior wall, the concha and, to a slight degree for pain only, the anthelix and antitragus (Fig. 5 b). There was also a small area behind the ear, over the base of the scaphoid and in the region of the auricular mastoid fossa, close to the point of attachment, where all forms of cutaneous sensation were lost and pain sense greatly impaired in the neighbouring field (Fig. 5c). Comparing this area with the residual zone remaining in Case 1 (Fig. 3b), there appears to be no doubt that the major supply to this area is by means of the vagus. The findings are extremely like those of Sherrington on the macaque (Fig. 6).

It was striking to note the relief obtained from pain by the patient. He was profuse in his gratitude and insisted on sitting up in bed to express himself a few minutes after the close of the operation, in spite of instructions for absolute quiet following a posterior fossa exploration.

My experience has been that there is little reaction following this type of operation, where pressure from a tumour is not a complicating factor, if the procedure is done under local anæsthesia, and the approach to the undersurface of the cerebellum is made extra-arachnoidally, until the root is reached. Careful freeing of the arachnoid from the dura is possible, and if this be done no spinal fluid escapes from the cisterna magna into the wound and no blood is allowed to enter the subarachnoid space; failure to prevent this is, in my opinion, one of the causes for the postoperative crises seen in some cases of posterior fossa exploration.

The patient was immediately examined for motility of the pharynx and muscles of swallowing. The soft palate was seen to be paralysed; there was great difficulty in swallowing, and the voice was very husky, due to paralysis of the left vocal cord. The patient choked on a small draught of water. He

was carefully instructed in swallowing during the act of expiration, and after several attempts was able to take fluids by mouth slowly, without choking or coughing. The 'gag' reflex was found to be absent on the left. There appeared to be no recognition of pain or touch on the left side of the mouth, tongue, cheek (trigeminus), pharynx, or base of the tongue (vagus). The pain had completely disappeared from the ear and throat. Deep pressure on the left side of the neck against the mass had always produced extreme pain. He was no longer conscious of this procedure and except for the mechanical difficulty in swallowing there was no pain attached to the act. There was no further pain referred to the ear. Morphine was discontinued and he accepted the difficulty of swallowing and phonation without complaint. Relieved of his pain he fell asleep and slept soundly for fourteen hours.

The following day he was examined again and the findings carefully checked. The sense of taste was present on the left. He recognized salt, sweet and bitter substances, though he had difficulty in determining the position of the stimulus. The tongue and inner surface of the mouth were intact in this case ;

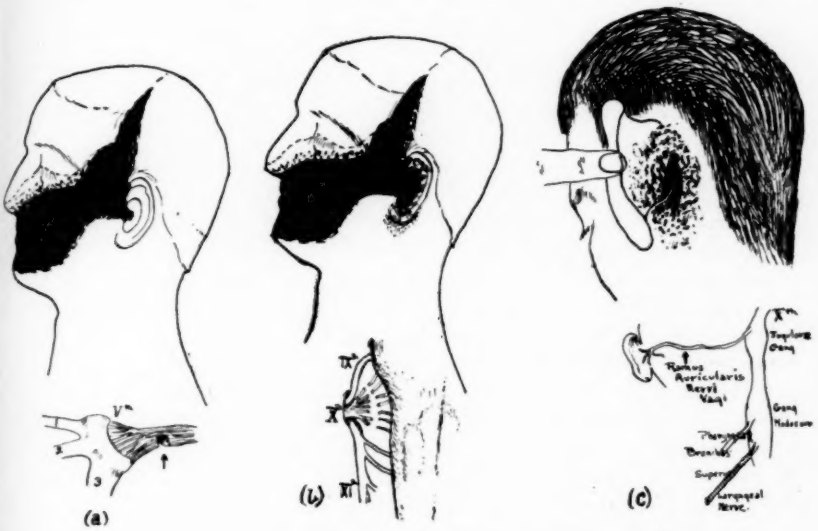

FIG. 5. Case 2,

(a) Anæsthesia produced after first operation, following subtotal avulsion of the posterior root of the fifth but leaving intact the upper fibre so as not to impare the trophic supply to the eye.

(b) Resultant anæsthesia after section of the intracranial root of the vagus. Note the extension of the zone of anæsthesia into the concha and on to the anthelix.

(c) Small triangle at back of ear which became anæsthetic following section of the vagus. This zone is supplied by the ramus auricularis nervi vagi. As all pain was relieved after section of the vagus it is probable that the pain referred to the region of the ear arose from involvement of the pharyngeal and laryngeal branches of the vagus, with manifestations referred peripherally through the ramus auricularis nervi vagi.

the primary lesion having been cauterized had disappeared, leaving deep metastases in the floor of the mouth and throat through the lymphatics.

The nurse states that on the morning of the fourth day, as the patient sat up and taking a glass of water drank freely, he choked and died before she could summon aid. It is probable that he forgot momentarily the difficulty in swallowing and inhaled a large amount of liquid.

DISCUSSION.

The two cases offer an extremely interesting physiological study even in the presence of the pathological lesion. The infiltrating character of the lesion probably accounts for the lack of disturbance of the sensory factors prior to operation, and aside from some hyperalgesia and the pain, there was no demonstrable neurological involvement of the areas under consideration.

Case 1 presented the possibility for isolated study of the tenth nerve in a surrounding field of anæsthesia, as well as the loss of glossopharyngeal function.

Case 2 presented the possibility for isolated study of the ninth nerve in a surrounding field of anæsthesia, as well as of the functions lost through destruction of the vagus.

These studies would suggest that the glossopharyngeal nerve in its true root components has to do primarily with the sense of taste, and in some way regulates secretory impulses arising from gustatory stimulation. It may well be considered as a nerve of special sense similar to the optic and the auditory.

The vagus in all probability supplies common sensation to the pharynx and larynx, dispersing these fibres in their extracranial course directly by its own branches and indirectly by filaments carried by the extracranial trunk of the ninth. It also supplies common sensation to a portion of the external ear. It is undoubtedly the chief motor supply to the pharynx and larynx and probably to the soft palate. It is responsible for the ' gag ' reflex and for reflex pain in the ear, due to involvement of its pharyngeal branches. The motor fibres which supply the vocal cord leave by the vagus root and not the vagus accessory, as has been claimed by some.

Section of the ninth nerve was undertaken in Case 1 because of pain in the throat and ear, a syndrome which has been described by Doyle[15], and given the name of glossopharyngeal neuralgia. Operative intervention for this type of pain has been undertaken successfully by Adson[8], their studies and work being based upon that of Sicard and Robineau[16]. I owe to Adson the technique and inspiration for intracranial section of the ninth nerve. He first pointed out the possibility of intracranial section of this structure in 1923, and since that time has had three cases, the results of which will no doubt be published in the near future.

In his first case of intracranial section, he cut the ninth nerve along with a few fibres of the tenth. The sensory factors of this case were not published

in the report of the surgical procedure[7]. In his second and third cases, the ninth nerve was sectioned, but because of the condition of the patients opportunity did not permit observations on the sensory results obtained.

Four cases of extracranial section of the ninth and tenth nerves for glossopharyngeal neuralgia were reported by Adson[8]. One of this series, reported originally by Doyle[15], included section of the posterior root of the fifth, along with extracranial section of the ninth and the superior laryngeal branch of the tenth. The sensory findings were carefully charted. As is evident from the anatomical reconstruction shown in Fig. 1, the section of this nerve peripherally gives little information as to its individual root component, because of added fibres acquired upon leaving its cranial origin.

In the four cases of extracranial ablation of the ninth and tenth sensory factors Adson states that in the first case the fifth posterior root was resected and the extracranial approach made to the region of the petrous ganglion of the ninth, and the jugular ganglion of the tenth. The pharyngeal branches of the ninth and tenth were sectioned, with relief of pain in the throat. In the second case, the branches of the ninth were apparently not cut. The tenth was avulsed by mistake. In the third case the branches of the ninth and the nerve itself were avulsed, but no final reports or sensory determinations were available, although the patient was free from pain. In the fourth case, both the ninth and tenth pharyngeal branches were avulsed, and pain developed in the eye with lachrymation and manifestations of rhinorrhœa. It is evident that Adson's work is the most extensive on this subject, but as far as the determination of the actual sensory component of the ninth and tenth nerve roots is concerned the four extracranial cases do not permit of accurate analysis, because of the possibility of fibres having been given off from the tenth to the ninth, as they leave the posterior fossa, and thus the combined supply destroyed.

The results of Adson's successful case of intracranial section of the ninth nerve have not as yet been published. I understood from a conversation with Doyle that the patient was relieved, but that section of the ninth had been attended by some destruction of the fibres of the tenth, so that the relief of pain and the findings in this case are not clear-cut. Nevertheless, the relief of pain in this instance, as well as in the extracranial cases, points to the fact that the glossopharyngeus probably carries these sensory fibres in its extracranial course, or that the branches and roots of the vagus, which were sectioned, destroyed the pain arcs. Thus it becomes of great importance for future methods of relief to determine the exact functions of each of these structures, so that operative methods may be devised that will deal solely with the structures involved.

In my case, individual section of the ninth nerve intracranially failed to relieve the pain in the ear and throat, so that it was thought necessary to section the posterior root of the fifth nerve, believing that the auricular temporal branch of the fifth was responsible for the pain that occurred. Following section of

the posterior root of the fifth, all pain was relieved *excepting* the pain in the ear and throat which persisted and has persisted for the past thirteen months, during which time the patient has been under repeated study. Though the progress of her carcinomatous invasion has been greatly delayed by deep *X*-ray therapy, she is gradually becoming weaker and the growth is enlarging.

In both of these cases, pressure over the lateral aspect of the neck, in the submaxillary region and that of the superior laryngeal nerve, produced sharp pain in the throat and also pain referred to the ear. No sensory loss in the peripheral skin areas was present before operation. In both cases, it was difficult to determine why the patient should have pain in the ear, when the growth itself was situated in the floor of the mouth and in the upper portion of the neck. Unless we assume the extension of the carcinoma backward and upward, far beyond its confines as determined clinically, there appeared to be no explanation for the pain referred to the ear. However, after the destruction of the superior laryngeal portion of the tenth, as well as of the ramus auricularis nervi vagi, represented in the intracranial section of the tenth nerve, the pain disappeared.

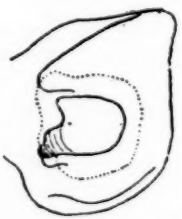

FIG. 6.

The "completely delimited area of auricular of vagus" determined experimentally for the macaque (Sherrington). Compare the areas obtained in man (figs. 3 and 5).

It would therefore seem that carcinoma invading the floor of the mouth is capable of involving the ear through the distribution of the superior laryngeal nerve and the pharyngeal branches of the vagus. Irritation of these structures, both by pressure and the act of swallowing, produces a reflex pain through the same nerve, *i.e.*, the tenth, referring that pain cutaneously to the distribution of the ramus auricularis nervi vagi, within the ear.

From my observations, therefore, it would seem that the sensory fibres of pain, distributed to the pharynx and to the region of the ear, in the zone of so-called glossopharyngeal neuralgia, do not correspond to a function of the ninth nerve in its intracranial representation; this syndrome is in reality a manifestation of involvement of the tenth nerve in its sensory components. The term 'glossopharyngeal neuralgia' does not designate either the exact location of the pain, or the structures which transmit the painful impulses. A

better term, inclusive of both factors, would in my opinion be ' vagal auricular-pharyngeal neuralgia,' the manifestations of which are those of so-called glossopharyngeal neuralgia.

CONCLUSIONS.

(1) The glossopharyngeus is probably a nerve of special sense, devoted to gustatory and secretory function.

(2) The vagus nerve supplies a small cutaneous area in the region of the concha of the ear, as well as common sensation to the pharynx and larynx. It contains in all probability the major motor fibres which supply the soft palate and pharyngeal wall, and it is the motor nerve for the regulation and motility of the vocal cord. The ' gag ' reflex is a function of the vagus.

(3) Intracranial section of the root should determine the nuclear functions of these nerves, and further establish the exact physiology of each.

BIBLIOGRAPHY.

[1] SHERRINGTON, C. S., " Experiments in examination of the peripheral distribution of the fibres of the posterior roots of some spinal nerves," *Phil. Trans. Roy. Soc., London*, Series B, 1898, exc, 45.

[2] OPPENHEIM, H., *Textbook of Nervous Diseases*, vol. i, 495 (Eng. ed., 1911).

[3] WEISENBURG, T. H., *Jour. Amer. Med. Assoc.*, 1910, liv, 1600.

[4] SPALTEHOLZ, W., *Hand Atlas of Human Anatomy*, 4th Eng. ed., vol. iii, 1923.

[5] PIERSOL, GEORGE A., *Human Anatomy*, vol. ii, 1916.

[6] PITRES, A., and TESTUT, L., *Les nerfs et schémas*, Paris, 1925.

[7] ZANDER, R., *Merkel's Festschrift*, 1897, 1.

[8] ADSON, A. W., " Surgical treatment of glossopharyngeal neuralgia," *Arch. of Neurol. and Psychiat.*, 1924, xii, 487.

[9] FAY, TEMPLE, " The surgical relief of pain in deep carcinoma of the face and neck," *Amer. Jour. Roent. Rad. Ther.*, xiv, 1.

Ibid, " Cervical rhizotomy for pain in carcinoma of the neck," *Surg. Gyn. Obs.*, xliii, 366.

[10] SPILLER, W. G., and FAY, TEMPLE, " Observations on the sensory supply of the head and neck," *American Neurological Assoc.*, June 1926, unpublished.

[11] CUSHING, HARVEY, " The sensory field of the cranial fifth nerve," *Bull. Johns Hopkins Hosp.*, 1904, xv, 213.

[12] PEGLER, L. H., *Anatomical Tables of the Anatomy and Physiology of the Fifth Cranial or Trigeminal Nerve and of its Ganglia and Connections*, London, 1913.

[13] FROHSE, FRITZ, *Die oberflächlichen Nerven des Kopfes*, Berlin, 1895.

[14] FRAZIER, CHARLES H., " Subtotal resection of the sensory root for relief of major trigeminal neuralgia," *Arch. of Neurol and Psychiat.*, 1925, xiii, 378.

Ibid, and WHITEHEAD, E., " The morphology of the Gasserian ganglion," *Brain*, 1926, xlviii, 458.

[15] DOYLE, J. B., " A study of four cases of glossopharyngeal neuralgia," *Arch. of Neurol. and Psychiat.*, 1923, ix, 34.

[16] SICARD R., and ROBINEAU, " Algie vélo-pharyngée éssentielle ; traitement chirurgical," *Rev. neurol.*, 1920, xxvi, 256.

SHYNESS.

By F. A. HAMPTON, LONDON.

SHYNESS is so common, at least in this country, that we tend to accept it as something inborn, as a characteristic part of the charm of youth, and as evidence, when it persists into later years, of a certain fineness of character; it seems even to be a trait, perhaps not wholly to be deplored, in the national temperament. But youth seems more than willing to forego this ornament, which is often the cause of a great deal of mental discomfort and may become a serious handicap in the business of life, and shyness has some claim, on these and other grounds, to the attention which is usually accorded to a neurosis.

The subject has recently been drawn into the compass of clinical psychology by Professor McDougall in his *Outline of Abnormal Psychology*, in which he suggests that schizophrenia is essentially a chronic and exaggerated degree of what, in normal people, we call embarrassment or 'morbid self-consciousness.' In both shyness and schizophrenia Professor McDougall sees a conflict between the instincts of submission and of self-assertion, which is intensified to a deadlock in the psychosis. Kretschmer, as Professor McDougall points out, has made a link between the two conditions in his "schizothymic type" of person, whom he describes as one "who is more prone than the average man to the paralysing condition of embarrassment; constantly concerned with himself; constantly desiring to assert himself, yet constantly failing to do so by reason of some inner inhibition."

SHYNESS AND SCHIZOPHRENIA.

The likeness between schizophrenia and shyness extends to one or two external characters. Shy persons sometimes develop a habitual smile, which, if not quite so meaningless as the characteristic smile of dementia præcox, certainly does not express any really cheerful feeling, but seems to serve as a cloak to the personality and perhaps, as it does in schizophrenia, to ward off any attempt at intimacy. So much has been read into the smile of the Mona Lisa that one hesitates to suggest that it belongs to one or other of these categories.

In the reserved type of shyness we sometimes find a mask-like countenance that recalls the immobile, but not quite lifeless facies of the schizophrenic; and the habitual movements sometimes developed by shy people are occasionally sufficiently stereotyped to recall those of schizophrenia.

The following case* shows that the likeness between the two conditions may be sufficiently close to cause difficulty in diagnosis.

Miss M., age 26, was admitted to hospital suffering from pains in the lumbar region for which no organic cause could be found. She stated that for some months her memory for recent events had been failing and that she had become nervous and restless.

For the first week after admission she lay in bed with her face to the wall and appeared to take no interest in her surroundings; she answered questions rationally and intelligently, but with reluctance and after a long delay. She was described in the case notes as "peculiar in her manner" and was referred for psychological treatment.

When seen by the writer she presented a picture of extreme embarrassment; she either returned no answer at all to questions or replied vaguely in a few monosyllables. She sat looking down, twisting a fold of her skirt or rubbing her finger along the edge of the table in feigned abstraction. She often wore a fixed and meaningless smile and occasionally blushed deeply for no apparent reason.

Direct investigation of the case was impossible, but questions given to the patient were fully and freely answered in writing when she was alone. From her written account it appeared that she was suffering from intense shyness, that she had lost her interest in the material world which had become so unreal to her that she was often held up in her work by the difficulty of deciding whether the objects with which she had to deal "were what they appeared to be, or something else." She sometimes lost her way and was often carried beyond her destination. Her loss of interest in life had recently deepened to dislike and she had been obsessed with the idea of suicide. She lived a great part of her life in the day-dream of an ideal country, uninhabited except by birds and flowers, which she endowed with semi-human personalities and with which she held long conversations. In these fantasies she herself played a subordinate and inconspicuous part.

The patient found herself unable, against her will, to take much active interest in her friends and relations, but there seemed to be no fundamental diminution in her feeling for them.

Later in the investigation of her case the patient confessed to the secret obsession that she was repulsively ugly, "probably the ugliest person in London." In actual fact she was a wholesome-looking young woman, rather weather-beaten by an open air life and neither plain nor handsome. Her obsession had grown from the days of childhood, when she had been led to look upon herself as the ugly duckling of her family and it was now, apparently, unshakeable by argument.

The patient recovered sufficiently to return to work, and treatment, unavoidably broken off, remained incomplete. She has remained at work for some two years, still suffering slightly from her old symptoms, and her case, in spite of a certain likeness to schizophrenia, may reasonably be diagnosed as a severe neurosis.

Although the likeness between shyness and schizophrenia is striking and suggestive, we can hardly say, nor does Professor McDougall claim, that they differ only in degree; for a man may be intensely shy and yet as capable as anyone of deep feeling for his friends and family, whereas the schizophrenic has little affection for anyone but himself and is usually "his own lover and without a rival in the world."

It is here suggested that in shyness a normal instinct of self-assertion is inhibited by an abnormally active instinct of submission, while in schizophrenia an abnormally active instinct of self-assertion is inhibited (except in the later

* For permission to make use of the notes of this case the writer is indebted to the courtesy of Dr. W. G. Wyllie.

stages) by a normal instinct of submission. In the schizophrenic the morbidly active instinct is hardly ever in abeyance and dominates the personality, but in shyness it is only intermittently evoked and the balance of the personality is, therefore, not greatly disturbed.

THE CONFLICT IN SHYNESS.

The attractively neat and symmetrical concept of an instinct of self-assertion and self-abasement does not fit very easily the complex of factors that we meet in individual cases. It is especially difficult to find clear evidence for an instinct of submission (except as a component of the sexual instinct) and it is tempting to think that an instinct of self-assertion would be hardly discoverable in an ideally balanced personality, except as a self-protective reaction or as a component of the mating instinct. It seems necessary, therefore, to broaden our concept, and it is suggested that we may regard the shy person in general as suffering from *a conflict between an 'urge' to reach upwards to the normal level from a position of imagined inferiority and a deterrent fear of failure.* The fear of failure is enhanced by an irrational self-distrust due to the feeling of inferiority.

This view appears to diminish the likeness between schizophrenia and shyness; but the two conditions still appear similar in many ways. The schizophrenic seems to have no doubt of his superiority, but, usually after a few abortive attempts to impose it upon the world, he withdraws into himself and lives in a realm of fantasy where his superiority is unchallenged and untested, and where his belief in himself continues to grow, secure from the danger of being shaken by external criticism. The shy person also shrinks from the world, but because he feels unable to sustain there the normal position to which he knows that he is entitled; and he too, like the schizophrenic, usually enjoys a rich inner life of fantasy.

The unconscious protest of the shy person against his irrational feeling of inferiority leads him sometimes into direct or indirect self-assertion, or we may say that his natural tendency to self-assertion, repressed by a feeling of inferiority, tends to become manifest through indirect channels. The existence in shyness of this repressed self-assertion increases the likeness to schizophrenia, and the efflorescence which sometimes occurs in shy persons when their inhibitions are relieved by alcohol may be sufficiently opulent to recall the self-display of certain phases of the psychosis.

The feeling of inferiority, to which we have attributed the conflict in shyness, is of that kind which Adler has described and emphasised, and the neurosis to which it gives rise seems adequately explicable along the lines which he has formulated.

THE FEELING OF INFERIORITY IN SHYNESS.

The actual inferiority in shyness is never one that the shy person admits freely to himself or of which he is fully aware, and it may be noted that an inferiority that cannot be concealed, such as a hunch-back, dwarfness or a club

foot seldom causes shyness, whatever other effect it may have upon the personality. A feeling of inferiority is so uncomfortable that the subject usually tries to forget it rather than deal with it, with the result that it becomes repressed into the background of consciousness; a man may out-grow his inferiority without being aware that he has done so. This may happen when a boy at school acquires, perhaps only in his own eyes, the stigma of cowardice which may leave him with an awkward shyness in later life, for, though he may know that he is no more cowardly than his fellow men, he has either 'forgotten' the old inferiority or never cared to examine it in the light of subsequent experience. Such persons often found relief in the war if they were alert enough to realise that everyone felt fear in the line, but those of them who were too preoccupied with themselves to take note of the general reaction usually succumbed rapidly to a war neurosis from the strain of trying to conceal their normal feeling of fear and of keeping up their self-esteem.

An inability to play games well often causes a feeling of inferiority which persists long after the schoolboy standard of the importance of games has been revised.

A real or fancied absence of physical attractiveness is a commoner cause of shyness in men than might be expected, and the feeling of inferiority from this source is very liable to be repressed, since it is incompatible with the acknowledged standard of values.

Social position and good birth seem to retain their value in the background of the mind long after the intellect has discounted them. The true peasant is seldom shy in the presence of his social superiors, whose position he admits; but shyness often cruelly victimises those who claim a social equality that they do not whole-heartedly feel. The impression that shyness was less common among our ancestors than it is today may be no more than a part of our wistful gilding of the past, but the editor of *The Diary of a Country Parson* seems to support it, when, commenting upon the Rev. Woodforde's habit of dining with his tradesmen, he suggests that social intercourse was freer in the eighteenth century than to-day because social differences were then more clearly marked and were unhesitatingly accepted on both sides.

The inferiority in shyness may be not actual but relative. A brilliant elder brother, or the ambitions of the parents, may set the boy a very high standard, and measuring himself by it he may, ever afterwards, feel inferior, although his intellect tells him that he is in no way below the ordinary level of achievement.

These are some of the commoner forms of inferiority which come to light when cases of shyness are investigated; others may be peculiar to the individual, but all have this in common, that the subject is unaware, or at most but dimly and fitfully aware of their connection with his disability.

THE PHENOMENA OF SHYNESS.

Most of the reactions of shyness are due to fear, which seems on investigation to be always the fear of being looked down upon, a result which is specially dreaded by the shy person since it would confirm the suspicion of inferiority which he dimly feels but hopes to be unfounded. In acute cases the fear may cause a physical and mental paralysis (though here Professor McDougall sees the victim locked in a conflict between the equipotent instincts of self-assertion and self-abasement) and occasionally we may meet with its most primitive effect in a slight tendency to diarrhœa and urgency of micturition. More commonly the fear produces an anxious self-distrust which seeks to guard against betraying an inferiority by a meticulous attention to behaviour, a reaction which only aggravates the situation, since habitual movements are not improved in execution when they are carried out with conscious attention (cf. the two uses of the word *gauche*) and the necessary diversion of attention from the external situation is a further handicap. The precautions against self-betrayal are the more ineffective since the shy person is usually unaware of the inferiority that he wishes to conceal. The self-consciousness of this reaction is so large a part of shyness that it is sometimes used as a synonym for it, in spite of the fact that a person can be exquisitely self-conscious, as a well-dressed woman who is aware of deserved admiration may be, without feeling shy or uncomfortable.

The shy person may go beyond anxious attention to himself in the effort to hide his inferiority and be led to create an artificial personality as a façade to his real self, so that shyness may lead to posing. Less elaborately he may throw out a screen of uneasy loquacity or yet more uneasy facetiousness, such as Du Maurier used to caricature rather cruelly in *Punch*. He may take refuge behind a forbidding hauteur or a gruff surliness; he may become unwillingly self-assertive and argumentative, or truculent and aggressive—reactions that serve not only as a screen and defence to the personality, but provide an outlet for the repressed tendency to self-assertion. They are particularly unfortunate because the shyness that lies behind them is liable to escape detection and the man is apt to be misjudged; he belongs to that type which seems so different and usually so much more likeable when, in spite of his evasions, we come at last to know the man intimately.

Some of the devices of concealment are used by the shy person to conceal from himself and others the fact that he is feeling shy. To this end he may adopt gestures of assumed nonchalance, which are sometimes found to develop into a tic, or he may allow himself to appear off-hand and inattentive, and it is worth noting that the sufferer from shyness may obtain some relief by frankly admitting to himself that he feels shy.

It seems likely that much of the painful feeling of shyness may be due to the inhibition of the conative side of the fear. A shy child can run and hide in its mother's skirts, but the grown man must stand his ground, and his desire to escape is expressed only in the hopeless wish that the ground might open

and swallow him. He may become, in a general way, a 'retiring' character and, if he has the opportunity, slip away from the main thoroughfare of life into some byway of scholarship or natural science, to build up there a reputation of unchallenged erudition, very much in the same way as Cædmon, ashamed because he had no voice and could not sing to the harp which was passed round after supper in the monastery, fled from the community and made his own songs in a hermitage.

The idea of fear colours strongly the popular conception of shyness; some uses of the word *shy*, such as *work-shy*, *gun-shy*, etc., still express the original root meaning to *take fright*; while the equivalent words in other languages (none seem to be quite so comprehensive as the English word) usually denote some aspect of fear, though occasionally they imply shame or disgrace, which is really an after-effect of an attack of shyness. The Italians in *schivo* have borrowed from a Teutonic source the word for a quality which is perhaps unfamiliar to them, and the Spaniards in *huroño* have a word which expresses both shyness and disdain and describes, with some perspicacity, a certain form of shyness.

BLUSHING.

Blushing is an occasional accompaniment of shyness rather than a typical part of the reaction, yet it has usually been regarded as essentially one of the phenomena of shyness and is almost the only aspect of the neurosis which has received any scientific attention. Blushing, however, is not confined to shyness but is a typical manifestation of anger, and it is here suggested that the blush which often accompanies embarrassment is always a physiological reaction of anger. The blush of embarrassment is always associated with a dull feeling of anger, and the patient will explain that he is angry with himself for blushing, but investigation usually discloses a feeling of resentment, more or less repressed, against the person who caused the embarrassment. The blush so easily excited by teasing is often the prelude to an outburst of real or assumed anger and the blush of modesty is more surely evoked by an innuendo aimed against the person whose modesty is brought into play than by an open act of indecency, which may cause disgust but rarely leads to blushing.

SHYNESS AND STAMMERING.

There appears to be some relation between shyness and the commonest form of stammer. The two disabilities tend to occur in the same kind of situation (both disappear when the patient is alone or in the uncritical company of his dog) and in both an undefined feeling of inferiority, together with a protest against it, may be discovered upon investigation. Yet the stammerer is seldom shy, but is often successfully assertive and self-possessed, so that it seems as though shyness and stammering were alternative modes of reaction to the same factors and as though the physical inhibition of stammering were equivalent to the mental inhibition of shyness. A stammer might be compared with a conversion hysteria and shyness with an anxiety neurosis, and it is

probably the extrovert (of Jung's classification) who tends to express his conflict in the physical terms of stammering or hysteria and the introvert who develops shyness or an anxiety condition.

THE ADVANTAGES OF SHYNESS.

There is probably some truth in La Rochefoucauld's observation that a sure way to predispose anyone in our favour is to appear at a disadvantage before him. Either for this reason or some other, the world is rather more than tolerant of shy people. But the shy are usually too preoccupied with themselves to appreciate the general attitude or to take much advantage of it, though we occasionally meet women who frankly confess to shyness but present no other evidence of the disability and, more rarely, we may note some half-conscious exploitation of shyness, as in the case of a commercial traveller, under treatment by the writer for an anxiety neurosis, who was shrewd enough to realise that the extreme diffidence from which he suffered sometimes enabled him to obtain an interview where the professional self-assertion of his colleagues had failed.

When we come to examine the deeper, unconscious levels we meet indications that in shyness, as in other neuroses, the symptoms may represent the deformed fulfillment of a repressed wish. It is significant that the manifestations of shyness often attract the very attention that the sufferer is, consciously, so desperately anxious to avoid. This result, which seems to the patient an unkind aggravation of his discomfort, often appears on investigation to be the involuntary expression of a repressed tendency to self-assertion. It is illustrated in the following case, where, however, something faintly histrionic in the shyness sets it perhaps a little outside the ordinary category.

> Miss N., under treatment for certain phobias, was so diffident that she was never able to enter the consulting-room when she was announced, but remained hovering outside the door until the writer came forward and ushered her personally into the room and conducted her to a chair: "like a Royal Personage," as she later described herself perspicaciously in this manœuvre.
>
> On entering a room in which there were two or three people she appeared extremely embarrassed and was always very apologetic, deprecatingly refusing the offer of a chair until, when her protests had been finally overcome and she had taken her place, she had become the centre of attention: an attention which she came to realise, on free association, was not altogether unwelcome to her.

It is perhaps worth noting that this patient never blushed and that blushing has always been accepted as evidence of complete ingenuousness, and probably with justice; though somewhere in the mid-Victorian era a cosmetic was put on the market in the form of a white powder which slowly oxidised to a deep red on exposure to the air.

THE TREATMENT OF SHYNESS.

Shy people are usually at pains to conceal their failing, so that uncomplicated cases seldom present themselves for treatment, although the advertisement of remedies in the lay press shows that treatment is sometimes sought from a

distance and probably secretly. But in spite of assertions to the contrary, it may be fairly safely assumed that the elixir or magic formula which will impart the self-confidence that is so widely desired is yet to be discovered.

Suggestion, if carefully used, may sometimes provide the shy person with sufficient self-confidence to enable him, by the proof of solid achievement, to acquire a true estimate of his worth and capacity. But a surer and ultimately more satisfactory method of treatment is to help the patient to a knowledge of the source of his feeling of inferiority, and when this is fully disclosed it will seldom be found that he is unable to deal with it effectively.

THE PATHOLOGY OF POSTENCEPHALITIC OCULAR DISTURBANCES IN THE LIGHT OF RECENT ANATOMICAL AND PHYSIOLOGICAL RESEARCH.

By L. J. J. MUSKENS, Amsterdam.

I.—The relative identity of the forced movements and forced positions seen in the lower quadrupeds after lesions of the supravestibular structures with the paralysis of lateral and upward movements seen in man after similar lesions.

Why is it that in medical practice one rarely sees real forced movements after lesions of the vestibular nerve, its nuclei, and its ascending secondary and tertiary connections? Such forced movements in the three planes are known to be extremely common after a great variety of lesions in the lower vertebrates and in all invertebrates where the bodily structure is symmetrical and the power of independent locomotion sufficiently developed.

In answer to such a question different points must be considered.

(1) The erect posture with the vertebral column vertical below the cranium has undoubtedly brought about a fundamental reorganisation of vestibular functions. As a matter of fact two forms of forced movement, performed by fishes, birds and quadrupeds after a lesion of certain vestibular structures in two different planes (cf. the horizontal and frontal planes in Figs. 1 and 2) are performed in the same plane in some other mammals, *i.e.*, circus and rolling movements. This occurs in man and the erect arboreal simians. (2) With increased development of the prosencephalon compensatory and quasi-voluntary inhibitory movements develop, so that the strong and persistent rolling movements seen in the rabbit after lesion of the vestibular nerve are rarely if ever seen in the higher quadrupeds. This inhibitory effect of the higher centres on the lower naturally reaches its greatest development in man. (3) Primary lesions of the vestibular nerve such as may be inflicted experimentally are extremely rare in man. It is, however, very common to find pathological changes in the secondary and tertiary connections of the vestibular system. In my earlier work [1,2,3] I pointed out that well-marked and strong movements of a forced character are only met with in the lower vertebrates after lesion of the peripheral vestibular nerve.

A lesion of the second neurone produces forced movements moderate in character, while after lesions of the third (prosencephalic) neurone they are still more moderate. The nystagmus which accompanies them exhibits itself as a slow movement in the direction of the forced movement, followed by a rapid jerk back.

Pathological affections of the vestibular tracts (*i.e.*, of one or more ascending tracts or of one or more nuclei) in man produce peculiar symptoms depending on the nature of the morbid process and on the neurones involved. Where the *first peripheral neurone* is slowly involved there is a tendency to fall to the affected side, as in tumour of the medulla, or the syndrome of the posterior inferior cerebellar artery (Wallenberg, Foix). Where the nucleus fastigius (or tecti) is involved there is a tendency to fall backwards. It must be remembered that recent anatomical and physiological research tends to show that nucleus to be a primary vestibular centre.*

As regards the *secondary vestibular neurone*, any lesion of the posterior longitudinal fasciculus produces in all vertebrates, as far as we can judge, circus movements to the *normal* side and rolling movements towards the *affected* side associated with a forced position of the head and eyes. (For the sake of simplicity forced movements in the vertical plane are at present disregarded).

In man such a lesion is usually caused by tubercular disease in the pons and is invariably productive of conjugate deviation of the head and eyes to the normal side (Bertelse, Rönne, Bruce, and others) and a tendency to fall to the affected side.

Lesions of the *third vestibular neurone*, *i.e.*, lesions on the oral side of the posterior commissure, produce in the lower animals forced movements, both circus and rolling in type, similar to those described as following lesions of the second neurone, but less vehement in character, while they take place in opposite directions. In the case of third neurone lesions the circus movements are towards the *affected* side, the rolling movements to the *normal* side. (See Figs. 1 and 2, and note the crossings at the posterior commissure). In some classes of animals forced movements in the vertical plane are the most pronounced after this lesion. In man pathological lesions affecting the third neurone are followed by symptoms which vary with the nature and localisation of such a lesion. In tabes and disseminated sclerosis there is disturbance of convergence (Barré and Duverger), in Parkinson's disease limitation of ocular movements in all directions coupled with disturbances of gait, while Prévost observed conjugate lateral deviation of the head and eyes in cases of apoplexy where the striate body was involved.

The third vestibular neurone in vertebrates connects the palæostriatal nuclei to the commissural, *i.e.*, supravestibular, nuclei. Further it is known that a lesion of this third vestibular neurone is followed by four different forms of forced movements, viz., lateral movement to either side, rolling movement to either side, movement upward and downward. It is therefore obvious

* This has been confirmed by van Gehuchten, Jr. (*L'Encéphale*, 1925, xx, 530, and *Proc. (Kon. Akad., Amsterdam*, 1925, xxviii, No. 1). I purpose to demonstrate in a later publication as I did in a former[2], that anatomical and physiological observations made on different classes of animals tend to show that there are separate vestibular centres corresponding to lateral movement of the body and of the eyes from right to left and vice versa; for rotating movements to either side; and for upward and downward locomotion—each connected by secondary vestibular bundles with their particular supravestibular centres near the posterior commissure.

that after a lesion in this region in the lower animals, and of the frontal cerebral pole in man, so-called cerebellar symptoms may be expected (" vorbeizeigen," falling to the normal side, rolling movements, circus movements to the affected side). In man the forced movements in the horizontal plane are replaced in certain cases by tonic conjugate deviation of the eyeballs in one direction, and rolling movements by falling to one side and by concomitant " skew deviation " of the eyes (Magendie, Hertwig). Such a phenomenon is usually easily recognised as head, eyes, and occasionally extremities are deviated in the same way. Occasionally the complete primitive phenomenon may be seen with circus movements and rolling movements about the axis. Certain lesions in this region produce symptoms which are due to implication of the præcommissural vestibular structures, but which exhibit a special character. For example, there is the stiffness of the neck and opisthotnus found in tubercular meningitis, this being probably due to the lesion involving the basal longitudinal bundle (Wallenberg) which is situated superficially on the base of the forebrain ; falling backward is seen where a tumour involves the genu of the corpus callosum ; postural and oculomotor disturbances occur when epiphysis and hypophysis are involved.

II.—Which of the supravestibular centres have been localised and what is the result of a lesion in such centres ?

The work of Cajal, Held, van Gehuchten and Boyce, supported by the later work of Ariens Kappers and that from the laboratory of Chiaruggi (Castaldi and Beccari), have shown that in the base of the mesencephalon of all vertebrates is a complex of cell-groups which are connected with the posterior longitudinal bundle and the posterior commissure. These connections have been recognised for some considerable time. In later work (*loc. cit.*) where anatomo-physiological methods of research have been combined it has been found that from at least two of these groups of cells at the level of the posterior commissure (nucleus commissuræ posterioris and nucleus interstitialis) a bundle of fibres descends into the posterior longitudinal fasciculus. In the first case the bundle is composed of thin fibres which send collateral branches to the nucleus of the third cranial nerve. It does not descend much below the level of the nucleus abducens, to which it (Fig. 1) sends collateral branches. This bundle is also known as the tractus commissuromedullaris. The second bundle is composed of thick fibres, collateral branches are sent to the nuclei of the third and fourth cranial nerves (Wallenberg), while the bundle itself can be traced far down the cord. It is known as the tractus interstitiospinalis (or Boyce's tract) (Fig. 2). Experiments on cats and pigeons have demonstrated a certain definite connection between lesions of these commissural cell-groups or nuclei and certain types of forced movement. A lesion of the nucleus commissuræ posterioris is found to be associated with circus movements to the side of the lesion, while a lesion of the nucleus interstitialis is associated with rolling movements to the side opposite to the lesion. Should the lesion be situated

more anteriorly and sever the connections between these nuclei and the globus pallidus the resulting symptoms, as regards changes in locomotion and posture, are the same. These fibres between the commissural nuclei and the globus pallidus just described have been demonstrated anatomically in the cat and pigeon [3, 4]. Riese [5] has also identified these structures. It is suggested that these descending tracts in the posterior longitudinal fasciculus represent the final common path (Sherrington) associated with these two forms of locomotion and ocular movements.

At present there are no exact or dependable data concerning the centres or descending tracts governing forced movement in the vertical plane, *i.e.*, locomotion backward and forward, with concomitant deviation of the eyes upward and downward. It is, however, certain from experimental and clinical data that these centres and tracts are separate and distinct both from the nuclei and tracts just described, and from each other. Further there is definite evidence

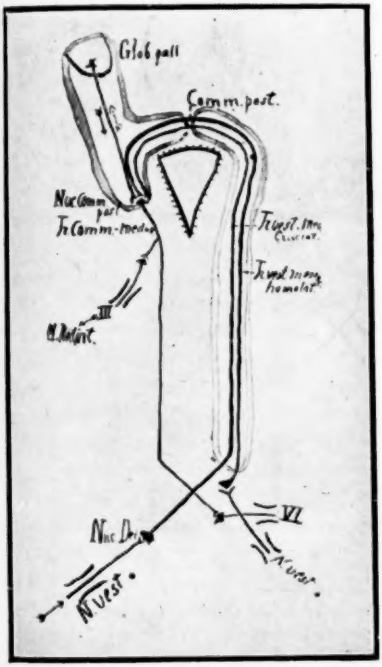

Fig. 1. Schematic representation of tracts and centres dealing with forced movements in the horizontal plane. A lesion of the areas indicated produces circus movements to the left.

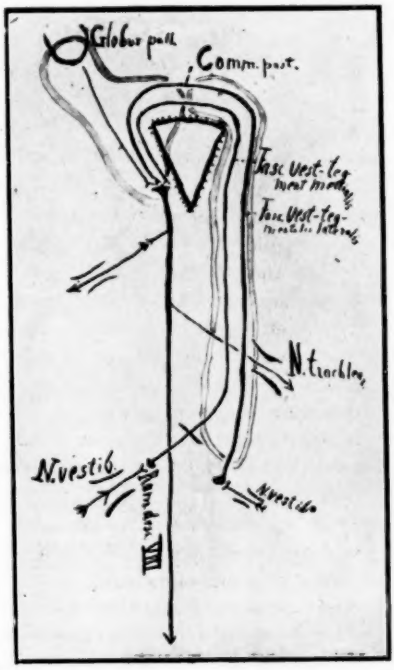

Fig. 2. Schematic representation of tracts and centres dealing with forced movements in the frontal plane. A lesion of the areas indicated produces rolling movements to the right.

that the primary vestibular centres involved in falling-backward and looking-upward movements are situated in the cerebellum (it is probably the nucleus tecti); the centre, involved in falling forward, near the raphe of the me dulla oblongata (See fig. 3). The circumstance of the first centre being localised in the cerebellum has long proved a stumbling-block and a misleading factor in the investigation of cerebellar localisation. As yet the exact course of the fibres from these centres to their supravestibular centre is not known, but the evidence afforded by experimental work and from certain clinical cases indicates that the structures dealing with forced movements in the vertical plane ascend in the base of the mesencephalon very near the median line.

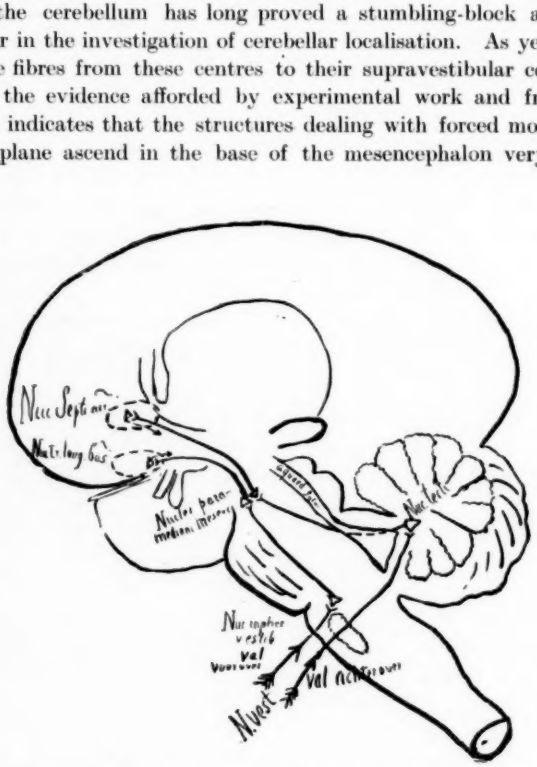

Fig. 3. Schematic representation of tracts and centres dealing with forced movements in the vertical plane. If the path including nuc. tecti, a mesencephalic nucleus, and nuc. septi accumbens be interrupted, falling backward ensues. If the path including nuc. raphaeos, a mesencephalic nucleus, and nuc. tr. longit. basalis be interrupted, falling forward ensues.

III.—What light do recent anatomical and physiological researches on secondary and tertiary vestibular tracts throw on the pathogenesis of postencephalitic ocular disturbances, and vice versa?

Marinesco, Radovici and Draganesco[6] agree in the view that all efforts at classifying postencephalitic oculomotor lesions are doomed to failure because of our present ignorance of the physiology of the "centres in the basal gangliä."

So far the clinical data concerning these curious symptoms have been supplied mainly by the French school of neurologists. It is interesting and important to note that amongst these clinical reports cases occur illustrating all varieties of forced movements and forced positions which have been postulated experimentally as being certain of occurrence with partial lesions of the supravestibular centres near the posterior commissure and of their palæostriatal connections. (I have taken occasion elsewhere[7] to deal more fully with this stage in the growth of knowledge of this region). Among these cases tonic spasm of the eyes is described with conjugate deviation, also skew deviation (this forced position of the eyes is associated with rolling movements in lower vertebrates) and conjugate upward and downward spasm of the eyeballs. It is peculiarly interesting to find that the complete syndrome of circus movements, rolling movements with concomitant deviation of the eyes, and opisthotonus with upward deviation of the eyes has also been repeatedly observed and described. The value of recent anatomical and physiological researches as an aid in localisation is evident when the frequency of the combination of tonic lateral position of the eyes with the upward or downward position is considered. Thus it is evident from the researches already referred to above that the two bundles involved in these two forms of forced movement are close together only at one point, viz., just in front of the posterior commissure. This being so it is evident that the lesion must be situated near the median line. The lesion will therefore lie in the metathalamic region near the commissura posterior. Further it has been demonstrated experimentally that the tracts involved in lateral deviation of the eyes and lateral movements branch off laterally by Forel's field.

It is curious, since the other symptoms are definitely not due to any lesion of the pyramidal tracts, that early workers on postencephalitic oculogyric crises were inclined to ascribe these forced positions in the vertical plane to lesions in the corpus striatum (G. Lévy, Hunt, Vogt, Stern, v. Economo). Later workers, among whom are Trétiakoff, Marinesco, Goldstein, Claude, Hohman[8], MacKinley and Gowan came to the conclusion that alterations occurred mainly in the body of Luys. Hohman also noted changes in the nucleus of Darkschewitsch (nucleus commissuræ posterioris), nucleus interstitialis and reticularis. From the frequent combination of lateral and upward directions in ocular crises it is safe to infer that the lesion lies away from the striate bodies and further back in the region of the posterior commissure and hypothalamus. This is more especially the case where there is compound lateral and vertical deviation.

In the original work of Vogt[9], which led to the general recognition of lesions destroying the lenticulopallidal and pallido-mesencephalic tracts as the causative agent in the syndrome of paralysis agitans the corpus striatum was recognised as a complex of centres from which primary automatic movements originated. To allow of the occurrence of these movements various writers

on this subject have postulated the existence of a great number of tracts between the globus pallidus and the mesencephalic centres. It has, however, been admitted by Vogt that of all those tracts and bundles postulated as existing, only one has been identified in its course and function, viz., the pallidofugal tract which passes by Forel's bundle towards the nucleus commissuræ posterioris. This tract was described first in 1914,[3,4] as the main tract for lateral locomotion and lateral deviation of the eyes. It is interesting and important to find that the evidence afforded by clinical observations tends to bear out this conclusion reached by anatom-physiological research.

Vogt, Foerster and Economo claim to distinguish separate syndromes depending on lesions of the striatum and pallidum respectively. If this is the case it is necessary according to recent anatomo-physiological researches to recognise at least four more syndromes related to the region between the commissural mesencephalic nuclei and the globus pallidus, all connected with forced movements of the eyeballs. These are :—

(1) Mesencephalic syndrome characterised by oculomotor paralysis and diplopia, and probably by disturbances of convergence and pathological sleep (Pötzl[10]).

(2) Metathalamic syndrome, characterised by compound ocular crises upward and downward in direction, and absence of oculomotor paralysis and diplopia.

(3) Syndrome of the Luysian body, characterised most frequently by lateral deviation, rarely by compound oculogyric crises.

(4) The syndrome of Forel's bundle, characterised by simple lateral deviation.

After the foregoing exposition it is hardly necessary to point out that I cannot accept the view taken by Szymanownsky, Zylberlast Zand and Poston that the encephalitic virus has a peculiar affinity for the *vestibular* fibres in the lower animals and the *oculomotor* nerves in man. Neither do I agree with Fischer, who explains the peculiar upward position of the neck in upward oculogyric crises as a deliberate posture assumed by the patient to avoid painful cramp. The suggestion made by Monakow[11] that in addition to anatomical lesions there is also some interference with the normal production of cerebrospinal fluid in the third ventricle has not as yet been supported by any substantial evidence.

IV.—A comparison between the extrapyramidal paralysis agitans syndrome and the extrapyramidal postencephalitic syndrome.

Here again the evidence afforded by clinical cases suggests that a more accurate localisation of lesions in the palæo- and neo-striatum may comparatively soon be possible. Dubief and Dana have described general vascular changes in the cerebrospinal axis in paralysis agitans ; Winkler and Manschot described perivascular gliosis and atrophy of fibres in the lateral thalamic nucleus and globus pallidus. I have also pointed out[12] that from a physiological

point of view many symptoms of the disease indicate a lesion in the corpus striatum. Jelgersma was, however, the first to recognise distinct atrophy in the tracts of fibres passing from the nucleus lentiformis towards the thalamus, in the ansa lenticularis and Forel's bundle. This atrophy of fibres has also been recognised by Jelgersma in Huntington's chorea, and the main symptoms of this malady it is suggested are due to these changes. One thing is evident ; the symptoms produced by or associated with lesions in this area fall into one of two categories—continuous phenomena or paroxysmal phenomena. This, however, applies to extrapyramidal paralysis agitans and extrapyramidal postencephalitic disorders equally (Stertz[13]).

To make this clear the two types of symptoms are herewith enumerated and compared.

Extrapyramidal striatal (Parkinsonian) symptoms.	*Extrapyramidal substriate (postencephalitic) symptoms.*
No third nerve paralysis and diplopia.	Third nerve paralysis with diplopia (Barré Cords, Stern, Fischer).
General limitation of ocular movements.	Disturbances of convergence ; difference in pupils (Collier).
No pathological sleep.	Pathological sleep (Pötzl).
No oculogyric crises.	Oculogyric crises: *lateral*, with torticollis and circus movement (Fischer, Babinski, Cassirer, Higier). *downward*, with propulsion (Paulian). *upward*, with opisthotonus and retrogression (Marinesco, Draganesco, Stoiesco, Bing, Schwarz, Westphal).
	Wilson's fragmentary and partial decerebrate rigidity (Mourgue, Marie, Lévy, Wimmer).
Sialorrhœa.	Sialorrhœa.
Adiadokokinesis.	Adiadokokinesis.
	Spasm of masticatory muscles, chewing, yawning, stuttering.
Tremor, athetosis, chorea, spasmus mobilis, torsion-spasm, contractures.	Tremor parkinsonicus (Maas, Roger and Pourtales).
	Dysarthria (Economo, Lhermitte, Cornil).
	Athetosis (Lhermitte, Vogt, Marie, Levy, Spiller, Prince, Jakob, Foerster, Mendel).
Exaggeration of fixation reflex (Kleist).	Myoclonia.
Retardation of movement.	Striatal epilepsy (?) (Lhermitte, Cornil, Krebs, Thomalla, Krisch, Wimmer, Knapp, Stertz).
Deficient response to innervation or difficulty of passing from static to dynamic state (van Woerkom).	Tetanic convulsions (Vincent, Chavany, Stertz, Sterling).
Permanent paresis.	Glosso-palato-laryngeal and velum nystagmus.
Akinetic and hypertonic syndrome.	Akinetic and hypertonic syndrome (Vogt, Lhermitte, Foerster).
	Writer's cramp (Levy).

Forced laughter and weeping.
Pseudo-catalepsy.
Associated movements.
Psychical hypersensitiveness.
Intermittent claudication (?) (Magelhaes Lemos).
Fits of screaming (Kleist, Benedek, Schuster).
Hysterical fits (Vogt, Foix).
Katatonia.

From this table it is evident that the symptoms which must be ascribed to lesions of the region of the metathalamus, corpus Luysii, and Forel's fasciculus are lacking in the extrapyramidal paralysis agitans syndrome. On the other hand there is a great similarity between the two syndromes, which in the light of our present knowledge is not unexpected. It is obvious that all the symptoms depending on the atrophy described by Jelgersma in the fibre tracts from the striate body to the structures in the mesencephalon are bound to appear should a lesion involve the base of the mesencephalon. Further in the syndrome associated with lesions of the mesencephalon, metathalamus, corpus Luysii, and Forel's fasciculus symptoms must appear depending upon lesions affecting structures peculiar to the different regions, including pallidal and striatal structures. It is therefore evident that lesions situated in the præcommissural region must be more complicated symptomatologically; they are richer in symptoms than those of the striate bodies, because besides the symptoms of the latter they are bound to produce also their own.

REFERENCES.

[1] Muskens, L. J. J., *Jour. of Physiol.*, 1904, xxxi, 215.
[2] Muskens, L. J. J., *Brain*, 1914, xxxvi, 417.
[3] Muskens, L. J. J., *Brain*, 1922, xlv, 454.
[4] Muskens, L. J. J., *Kon. Akad. v. Wetensch., Amsterdam*, 1927, xxxvi, 296.
[5] Riese, W., *Zeits. f. d. g. Neurol. u. Psychiat.*, 1924, xc, 597.
[5] Marinesco, Radovici, and Draganesco, *Rev. neurol.*, 1925, i, 148.
[7] Muskens, L. J. J., *Rev. neurol.*, 1927, ii.
[8] Hohman, *Obersteiner's Arbeit.*, 1925, xxvii, 1.
[9] Vogt, O., *Sitzb. Heidelberg. Akad. d. Wissensch.*, 1919, Abh., 14.
[10] Pötzl, *Monats. f. Psychiat. u. Neurol.*, 1927, lxiv, 16.
[11] Monakow, C. von, *L'Encéph.*, 1925, 360.
[12] Muskens, L. J. J., *Psych. en Neurol. Blad.*, 1905, 143.
[13] Stertz, G., *Der extrapyramidalen Symptomenkomplex*, 1921.

Short Notes and Clinical Cases.

A CASE OF MIMIC FACIAL PARALYSIS.

By ANTHONY FEILING, London.

Examples of so-called mimic paralysis of the face—paralysis of the emotional and expressional movements with preservation of voluntary movements—are rare enough to justify the recording of the following case.

A boy, age eight, was admitted to hospital in May, 1927, on account of fits.

In September 1925 he fell, striking his head in the right temporal region. He was not rendered unconscious and recovered very quickly, showing no immediate effects beyond some bruising over the right temple. Some days later his parents noticed that the right side of the mouth did not appear to move as well as the left; this peculiarity was then observed to last for about 14 days.

About 28 days after the fall the first fit occurred. It was apparently a generalised epileptiform convulsion and took place in the night. Since that time attacks recurred about once a month up to the date of his admission to hospital.

These attacks would occur at any time of the day; there was no definite aura, but the attack was ushered in by a movement of the eyes to the right side; it is reported that the patient then muttered indistinctly and became unconscious. Definite convulsive movements then occurred, beginning in the right foot and spreading to the right leg and then all over the body. No post-convulsive paralysis had been noticed. No headache and no vomiting had been complained of, and between the fits the boy appeared to enjoy normal health.

One attack was observed in hospital almost immediately after his admission. Since that time no attacks at all have occurred. In this fit there was no apparent warning. It began abruptly with powerful deviation of the head and eyes to the right. He was quite unconscious. Clonic movements were observed, which started in the right foot but rapidly spread to involve both arms and both legs as well as the muscles of the face and jaws. The convulsive movements were greater on the right than on the left side. Recovery was rapid and there was no subsequent paralysis of the limbs.

Physical examination showed a boy of healthy appearance with no sign of organic disease except for the facial paralysis. Mentally he was bright and intelligent. Examination of the nervous system was quite negative except for the condition of the right side of the face. Examination of the skull revealed no abnormality with the exception of a slight difference in the percussion note over the two parietal eminences. *X*-ray examination of the skull was negative.

The Wassermann reaction in the blood was negative and the cerebrospinal fluid was normal in all respects.

The condition of the face, which is well seen in the accompanying photographs, was as follows: When the face was in repose (Fig. 1) a moderate asymmetry was seen, indicating a slight weakness of the muscles on the right side, with a flattening of the right nasolabial fold. During conversation a weakness of the expressional movements of the lower part of the face on the right side was very apparent. The weakness on emotional movements, however, as seen in smiling or laughing spontaneously, was so great as to amount

practically to a complete paralysis. Fig. 2 shows the face when smiling. It will be seen that there is nearly complete paralysis of the muscles of the lower part of the face, while a distinct paresis of the orbicularis palpebrarum is also apparent.

Voluntary innervation of the muscles of the right side of the face appeared to be completely preserved. Fig. 3 shows the condition when the patient was told to "show his teeth." Fig. 4 shows the condition when he was told to "shut his eyes tight." In this last photograph it can be seen that the associated movements of the lower part of the face are as well retained as the voluntary movements of the upper part.

Since the patient first came under observation in May, 1927, no change in his condition has been recorded.

DISCUSSION.

Although this case is reported principally on account of the unusual form of facial paralysis displayed, the diagnosis of the nature as well as of the site of the lesion is a matter of considerable interest. The symptom appeared to arise in such direct relation to the alleged trauma that at first it was only natural to connect the two events. Seeing that the injury was on the right side of the skull some 'contre-coup' effect on the opposite side of the brain seemed the most likely explanation of the right mimic facial paralysis. If such be the correct explanation the lesion must be considered to be cortical (or mainly so at any rate) and probably at either the frontal or temporal pole, which are recognised to be the most common sites for 'contre-coup' injuries. But a later investigation into the exact circumstances of the alleged fall suggests that it may well have been the first 'fit' which the patient ever had. In this event the 'contre-coup' theory loses much force and with it goes the only indication for the localisation of the lesion afforded by this particular case. It may, therefore, be of some value to review very briefly certain recorded examples of this condition, which indeed is so sparsely reported in the literature as to confirm the writer's first suspicion that it must be an uncommon clinical event.

In a paper in this JOURNAL on "Pathological Laughing and Crying," Wilson [1] has discussed the question of mimic paralysis of the face and reported three cases of his own. He quotes Sir Charles Bell [2] and Stromeyer, [3] writing in 1844 and 1837 respectively, whereby it is clear that this form of facial paralysis had been recognised by these early observers. Thus Bell writes: "In short you find that your patient sometimes exhibits paralysis of the side of the face only when he smiles or laughs, at other times it is not observable." And Stromeyer reports the case of a girl aged 12 in whom "the right side of the face continued expressionless in emotions . . . nevertheless the child was as able to control the muscles of this side as those on the left."

Nothnagel [4] has been credited with placing a centre for emotional and expressional movements of the face in the optic thalamus. In his well-known book he suggested the existence of a psychoreflex path for facial movements, separate from the ordinary path of the facial fibres in the pyramidal tract, a separation which was assumed to explain the usual dissociation between

Fig. I.
Shows the face in repose.

Fig. II.
A spontaneous smile.

Fig. III.
Told to "show his teeth."

Fig. IV.
Told to "shut his eyes tight."

voluntary and emotional movements of the face in the ordinary form of hemiplegia. He[5] later published two cases which were widely accepted as indicating the existence of a centre for emotional movements of the face in the optic thalamus. In one of these, where a left facial paralysis of the mimic type had been found, associated with a slight left hemiplegia, a large tumour of the right optic thalamus was discovered at autopsy. But as pointed out by Wilson[1] there was in addition definite disease of the internal capsule as well as of the corona radiata. In the other case, a glioma of the left optic thalamus was associated with a mimic paralysis of the right side of the face, but here the condition of the neighbouring parts is not fully described.

Later writers tended to accept Nothnagel's hypothesis, but many of the cases reported are too dubious to warrant their use as material on which deductions of any value in localisation may safely be based. The writer entirely agrees with the opinion of Wilson that the cases reported by Nonne,[6] Borst[7] and Kirchoff[8] are unsatisfactory in this respect.

Mills[9] in a valuable paper on the "Cerebral Mechanism of Emotional Expression" reports a case of mimic paralysis of the face where a careful autopsy was made. The case was one "of a symptom-complex showing emotional paralysis of one side of the face, associated with marked ataxia of the left upper and lower extremities, with paralysis of emotional expression in the right face, right nerve deafness and loss of pain and heat and cold on the right side. Autopsy showed a destruction of the ventral part of the dentate nucleus of the cerebellum and adjacent superior cerebellar peduncle, with degeneration of the mesencephalic root of the left fifth nerve and of the left lateral fillet." Mills says "the cause of the loss of emotional expression of the face . . . would appear to be related to the destruction of afferent tracts in the lemniscus or of this and some part of an important cerebellar arc."

In discussing the possible sites of lesions causing disorders of emotional expression, it is of interest to note that Mills accepts the possibility of such disorders being due to lesions of the "emotive cerebral cortex."

Spiller[10] records a case of mimic facial paralysis of unusual interest. His account of the case is illustrated by plates showing clearly the nature of the facial paralysis, which was associated with a tumour of the cerebellopontine angle. After operation the paralysis was much improved. Was this case an example of a mimic facial paralysis due to a lesion of the infranuclear portion of the nerve? Before accepting this suggestion we should be certain that the condition was not produced by pressure on the pons with consequent involvement of supranuclear facial fibres.

Monrad-Krohn[11] has reported a case of left-sided mimic facial paralysis in a patient the subject of the postencephalitic Parkonsonian state and considered that the "case supported the belief that the lenticular nucleus (probably in its pallidal part) contains the motor centre for emotional innervation, the thalamus probably being the corresponding sensory centre in the emotional reflex arc."

Wilson[1] has recorded three personal cases. In one with a left-sided mimic facial palsy the later course of the case indicated the presence of a cerebral tumour in the region of the right internal capsule and the right regio subthalamica.

In a second case the clinical picture consisted of emotional paralysis of the right side of the face, tremor of the right limbs, inactivity of the left pupil to light, with poor reaction on convergence and paresis of upward and downward movements of the eyes, a picture strongly suggesting a lesion of the mesencephalon.

His third case was one of a tumour of the mesencephalon and upper part of the pons verified by autopsy, where in addition to double Argyll Robertson pupil, nystagmus, tremor and ataxia of the left side an emotional paralysis of the left side of the face was present.

Symonds[12] mentions a mimic paresis of the face as a symptom of practical value in the diagnosis of temporal lobe abscesses. He refers to " a slight weakness of the opposite side of the face, mostly of the lower half, which may be present when the patient talks or smiles, but is less apparent when he responds to the usual test of showing the teeth at command."

It seems clear, therefore, that there is no justification for placing a ' centre ' for emotional movements of the face in the thalamus, a conclusion which emerges both from a consideration of the reported cases of mimic paralysis of the face and from our modern knowledge of the symptomatology of lesions of the thalamus itself. The writer is disposed to agree fully with Wilson[1] in his suggestion that " there are corticifugal paths for the expression of the emotions via the faciorespiratory apparatus, distinct from those for voluntary innervation of the same nuclei."

For the photographs of the case here published the writer is indebted to the kind co-operation of Mr. Hugh Nicol, M.Sc.

REFERENCES.

[1] Wilson, S. A. K., *Jour. Neurol. and Psychopath.*, 1924, iv, 299.
[2] Bell, Ch., *The Nervous System of the Human Body*, 3rd ed., 1844, 256.
[3] Stromeyer, *Casper's Woch. f. d. g. Heilk.*, 1837, 33.
[4] Nothnagel, *Topische Diagnostik d. Nervenkrankheiten*, 1879.
[5] *Do.* *Zeit. f. Klin. Med.*, 1889, xvi, 424.
[6] Nonne, M., *Neur. Centralb.*, 1895, xiv, 476.
[7] Borst, *Neur. Centralb.*, 1901, xx, 155.
[8] Kirchhoff, *Der Gesichtausdruck und seine Bahnen*, 1922, 136.
[9] Mills, C. K., *Trans. Coll. Phys. Phila.*, 1912, 147.
[10] Spiller, W. G., *Amer. J. Med. Sc.*, 1912, cxliii, 390.
[11] Monrad-Krohn, G., *Brain*, 1924, xlvii, 22.
[12] Symonds, C. P., *Proc. Roy. Soc. Med.* (*Otol. Sect.*), 1926-27, xx, 41.

Editorial.

THE END-RESULTS OF THE TREATMENT OF "SHELL-SHOCK."

THE outbreak of the great war found the country—perhaps all countries—unprepared for the new conditions which must inevitably arise. In some cases the unpreparedness may have been due to a lack of foresight, in other cases the problems could scarcely have been foreseen. Very early in the war it was obvious that a new and pressing problem had arisen—the problem of the "nerve sick" soldier. This problem has no doubt been presented to all ages and to all civilisations, but it is doubtful whether its seriousness could have been forecasted. At the outbreak of war none knew what would be the effect of modern methods of fighting, of high explosives, or the prolonged state of what in effect were siege conditions. In any case, shortly after the Mons retreat the seriousness of the problem was realised and steps were taken to meet it.

It is now more than twelve years since the first hospitals for cases of "shell-shock" were opened in this country. At the hands of various men various forms of treatment were used in these hospitals, in some cases a hospital employing almost exclusively a particular line of treatment, in other cases more broad-minded policies being adopted. These institutions were increased in numbers as the war proceeded, and in many cases were continued long after the cessation of hostilities.

Twelve years' experience must have provided a mass of information which might be of the greatest value. All who are connected with this speciality of medical science know that in individual cases each line of treatment was successful. General information is, however, urgently needed as to the mass effects of the different lines of treatment and the suitability of each to the different kinds of individual. Does isolation, hypnotism, Freudism, or any other particular form of treatment give the best results in the mass? If all of these lines of treatment are uniformly successful (as they are not), which is the most

rapid in effecting its cure? If none of them is uniformly successful, to what types of individuals is each the best adapted?

The literature of this subject bears evidence of careful and painstaking examination of the effects of specific forms of treatment, but there is little evidence obtainable as to the comparative success of the divergent modes.

In the early days of the war the exponents of one or other form of treatment not uncommonly took the position that the particular treatment was founded upon the most rational theoretical basis, but that its practical results could alone be measured after a lapse of years. There was no doubt at that time some divergence between individual estimates of value regarding the theoretical foundations of different lines of treatment, but Time has now played his card.

There are available to-day great sources of information with regard to the later effects of the treatment of "shell-shock." The entry books of the special hospitals, the medical history sheets of the patients, and their subsequent histories in the possession of the Ministry of Pensions, together no doubt with other sources of information, combine to give data the marshalling of which, in Baedeker's words, would be "laborious but repaying." A statistical examination of the histories of the cases admitted to certain of the "shell-shock" hospitals which notoriously specialised their lines of treatment would give evidence with regard to the mass effect of the specific form of treatment. In the early years of the war the necessary absence of any data with regard to the ultimate effects of different forms of treatment naturally led to some over-estimates. A cooler and more judicial examination of the practical effects now available (should the data be sought) might yield knowledge which would be of the greatest practical importance not only in these present days of peace, but if—which God forbid—we should again be faced with the problems of August 1914.

Abstracts.

Neurology.

NEURO-ANATOMY AND NEUROPHYSIOLOGY.

[56] **The island of Reil** (Quelques contributions à l'étude de l'insula de Reil).—G. MARINESCO and M. GOLDSTEIN. *Bull. Soc. Roum. de neurol.*, 1927, iv, 1.

ACCORDING to Campbell, two, and to Brodmann four, different cytoarchitectonic fields can be distinguished in the island of Reil. The authors themselves consider an anterior part, agranular, can be distinctly separated from a posterior, granular, part, and in this connexion they quote the recent researches of Economo and Koskinas, who agree that posteriorly the fourth or granular layer is strikingly developed. As a result of minute investigations of specimens from fœtus, child, and adult, Marinesco and Goldstein think that the island cannot be the seat of any one specific function, in view of its histological diversities. They suggest that the antero-superior insula, whose anatomical characters resemble those of the frontal lobe (Broca's area) may play a part in speech associations ; the posterior insula, of parietal and temporal type, may be connected with sensory function ; the inferior insula is associated with olfactory function. S. A. K. W.

NEUROPATHOLOGY.

[57] **Nature and pathogenesis of plaques of senile degeneration** (Sulla natura e genesi delle placche senili).—D. BOLSI. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 237.

THE literature, methods of investigation and incidence of the plaques are discussed. In view of their structure and distribution it would seem that the plaques originate from neurones, glial and microglial cells, and from the accumulation of extraneous substances and products of degeneration. It is likely that the first stage in their formation consists in a chemical alteration in the fundamental substance which constitutes the medium in which the morphological elements of the nervous tissue live. This may be altered both in normal and pathological old age by processes of toxicity and involutional metabolism. This chemical alteration takes place in the grey matter of the cerebral cortex and especially in the hippocampus. It would seem that special areas and strata of nervous tissue are susceptible and this may be due to some special chemical constitution. This naturally excludes any connection between the formation of plaques and alterations in the circulation. Occasionally plaques occur in the white matter.

At first they are represented by minute foci of silver-staining substance, but very soon, by some chemiotactic irritation, the surrounding neuroglia is affected. Hypertrophy takes place first in an effort of defence but this soon breaks down and degeneration occurs, going on to complete disintegration. The products of this form the nucleus of the classical wheel-like plaque. It has not been possible to recognise any participation of the oligodendroglia in the formation of the plaques. Neurones and other glial cells are later involved in the destructive process. The ultimate destination of the plaques is uncertain.

Diversity in the descriptions of the plaques in the literature is due to the diversity in staining of the degenerated cell tissue and the chemical silver-staining substance. A very complete bibliography is given.

R. G. G.

[58] **The histopathogenesis of tabes** (Contribucion a la histopatogenia del tabes).—JULIO L. HANON. *Rev. oto-neuro-oftalm. y de cirug. neur.*, 1927, i, 91.

THE writer has made a minute investigation of the tissues taken from an early case of tabes dorsalis and subjected to different histological techniques. He finds the most constant changes in the dorsal root ganglion cells, and advances arguments in favour of the contention that the syphilitic virus attacks these cells primarily in tabes. He looks with some disfavour on the theory of Nageotte and others who have followed him, largely because changes in the "radicular nerve," of the nature of an interstitial neuritis, are inconstant and because certain fibres therein are always exempted—a point against any theory of mechanical strangulation. On the other hand, it is admitted no visible parallelism exists between degree of cellular change in dorsal root ganglion and degeneration in dorsal root corresponding, but this can be explained on the view that the exact anatomical relationships as between cells and fibres at this spot have not been determined. In any case, a toxin can be considered to act selectively, whereas a mechanical process can not. S. A. K. W.

[59] **The pathogenesis of the epileptic seizure** (Die Pathogenese des epileptischen Krampfes).—W. SPIELMEYER. *Zeits. f. d. g. Neurol. u. Psychiat.*, 1927, cix, 501.

BASING his views on the pathological examination of no less than 126 cases of idiopathic and symptomatic epilepsy, Professor Spielmeyer has found changes in 80 per cent. of a local character, viz., in cerebellum and in the cornu Ammonis, both of which regions are in the vascular distribution of the posterior cerebral artery. In the cornu Ammonis he has seen changes in the cells of a definitely ischæmic kind, but even here one part is resistant while another degenerates. In the cerebellum the changes are noticed in the Purkinje cells and in the neighbouring and corresponding molecular layers. It is considered that these alterations are indicative of preparoxysmal angiospasm.

For anatomical reasons the cornu Ammonis and the cerebellum at the above-mentioned levels are unusually vulnerable, since there their blood-supply is least ample. In cases of acute CO poisoning changes in identically the same regions have been found by Weimann. Spielmeyer supposes that in the 20 per cent. negative cases the circulatory disorder has been insufficient to produce the structural changes discovered in others, or has for some reason not involved the distribution of the posterior cerebral artery.

S. A. K. W.

[60] **Alterations in the central nervous system in fatigue** (Alterazioni del sistema nervoso centrale nella fatica).—V. Tronconi. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 33.

In animals that are fatigued the following changes are found. With Nissl's method a marked chromatolysis of the tigroid zone, especially of the peripheral part, in the large cells of the spinal ganglia : the nuclei are altered, and their outlines are irregular. Similar changes are noted by Perl's method with organic iron. There is no alteration in morphological structure of the endocellular fibrils in the cortical cells. There is no change in Golgi's reticulum even in severe fatigue. The mitotic figures studied by Meves and Rigaud's method in the ganglial cells of fatigued animals are much decreased in number and size, and their staining properties are reduced. On microscopic examination it is possible to show a diminution of lipoid in ganglionic cells and in those of the spinal cord, with a tendency to adoption of ring forms. It is probable that there is a diminution in the quantity of fatty and lipoid substance in the ganglia and spinal cord of all fatigued animals.

R. G. G.

[61] **The colloidal reaction of Berlin blue and its clinical value** (La reazione colloidale del bleu di Berlino ed il sue valore clinico).—U. de Giacomo. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 281.

The reaction of Berlin blue according to the method of Santangelo (as slightly modified by the author) has a definite clinical value and is easily carried out. A positive reaction determines with absolute certainty the pathological character of the cerebrospinal fluid examined. The reaction proves positive in all cases of paresis, taboparesis, tabes, tubercular meningitis, purulent meningitis, spinal tumour and disseminated sclerosis. It was positive in one out of three cases of cerebrospinal syphilis and hydrocephalus respectively. It was constantly negative in cerebral arteriosclerosis, postencephalitic parkinsonism, spastic spinal paralysis, idiocy, epilepsy, dementia præcox and neurasthenia.

There is no correspondence between the reactions of Berlin blue and of Wassermann, but compared with Goebel's method it shows a slightly less

sensitivity. It corresponds to a certain extent with the total albumin in the fluid and more closely with the globulin, but not exactly with either. It may be possible to distinguish a characteristic form of curve in certain diseases.

R. G. G.

[62] **The presence of an oxytocic substance (posterior hypophysis extract) in cerebrospinal fluid.**—S. SHAPIRO. *Arch. of Neurol. and Psychiat.*, 1926, xv, 331.

THE author studied the oxytocic effect of 28 cerebrospinal fluids on the virgin guinea-pig uterus. The addition of cerebrospinal fluid during relaxation of the isolated guinea-pig uterus did not cause the sudden and maximal contraction characteristic of posterior lobe extract. On the contrary there was a tendency for these fluids to inhibit contraction, and all experiments failed to show that the intravenous injection of pituitary extract causes an increased secretion of the active principle present in the posterior lobe of the hypophysis into the cerebrospinal fluid.

R. M. S.

[63] **On the presence in the cerebrospinal fluid of products of the breaking up of albuminoid molecules** (Sul contenuto nel liquor dei prodotti di scissione della molecola albuminoidea).—A. MASSAZZA. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 1.

A RESEARCH has been carried out on 25 cerebrospinal fluids from patients suffering from various nervous diseases. The free amino-acids in the cerebrospinal fluid are increased in all the pathological conditions which give a positive result for the principal reactions, but this increase is not proportional to the degree of hyperalbuminosis. It is moderate in cerebral syphilis, but more noticeable in meningeal lesions and in the other syndromes with a meningitic colloidal curve. It is always in direct proportion to the leucoeytosis and to the type of meningitic curve for colloid precipitation.

In normal fluids the amino-acid varies from 1.5 to 1.9 mgm., and in lesions of the neuraxis with hyperalbuminosis from 2 to 4.5 mgm. Of the amino-acids contained in the total protein of the various types of fluids tyrosine, demonstrated by Millon's reaction, is shown to be in proportion to the quantity of total albumin.

Tryptophane, the aromatic groups, the hydrocarbons of the protein molecule and the xanthoproteins, while they correspond to a certain extent with the total quantity of albumin, only show a marked positive in fluids from meningeal lesions.

This gives a special character to the meningeal reactions of fluids. The author has investigated the presence of inorganic elements such as phosphorus, sodium, potassium, calcium and magnesium, but finds that these are not much modified in diseases.

R. G. G.

[64] **The pathogenesis and physiological pathology of herpes zoster** (Nouvelles contributions à la pathogenie et à la physiologie pathologique du zona zoster).—G. MARINESCO and S. DRAGANESCO. *Presse méd.*, 1927, xxxv, 1025.

THE authors hold that there is no such condition as symptomatic herpes zoster, or a zoster syndrome produced by different causes. All genuine zona is the expression of the action of the herpetic virus (zoster virus). Mucous and cutaneous vesicles are the result of the direct action of the virus on the skin or mucosa, and are not in any sense of the nature of trophic lesions consecutive to lesions of the root ganglia corresponding. Such central nervous lesions as are found with some constancy in cases of herpes zoster are to be ascribed to an ascending neuritis, the original infection localised in the skin propagating itself along the course of peripheral nerves in a central direction.

They quote in some detail the case of a man of 36, with right hemiplegia and a thalamic syndrome of the same side, who developed an abundant herpetic eruption on the affected leg, in the distribution mainly of L1-4. Lumbar puncture revealed a lymphocytosis of 30 per c.mm. It ran its course and disappeared eventually with the usual cicatrisation. Autopsy was performed no less than four years later, when the authors were surprised to find clear evidence of chronic inflammatory and hyperplastic reactions in the spinal ganglia and roots that had originally been involved, together with unmistakable local reactions in the areas of skin cicatrices. Round the posterolateral margin of the cord, and within it (posterior median septum, etc.) similar tissue reactions could be traced. Pathologically, the condition might be described as a chronic right lumbar ganglio-radiculo-myelitis.

Five diverse cases of cancer implicating either spinal root ganglia or Gasserian ganglion were subjected to histological scrutiny by way of control, and it was found in all of these that neoplastic infiltration of ganglia and roots had taken place, yet in no instance was herpetic eruption noted during life. The argument therefore is that when "symptomatic zona" occurs in neoplastic cases it is in reality caused by an unrecognised true or idiopathic herpes zoster virus, whose histological reactions are hidden by those of the cancerous process. Alternatively it may well be that a zoster virus, grafted on ganglia and roots already exhibiting neoplastic reactions, may be prevented from showing its usual tissue-manifestations.

Incidentally, reference is made at the close of the article to successful inoculation of herpes zoster in the human subject (one case out of 15 trials) by virus derived from herpetic vesicles in another subject. It developed four weeks after scarification of the right arm, appearing approximately in the segments D6 and D7 of the right side.

S. A. K. W.

SENSORIMOTOR NEUROLOGY.

[65] **A case of amaurotic idiocy.**—G. B. Hassin. *Arch. of Neurol. and Psychiat.*, 1926, xvi, 708.

In contrast to the great number of clinical and pathological reports on the infantile (Tay-Sachs) type of amaurotic idiocy, reports on the juvenile and especially the so-called late infantile (Bielschowsky) types are scarce. This is probably due to the fact that the last two varieties are rare and do not present such a clear-cut clinical picture as the classic form of Tay-Sachs disease. The case described by Hassin occurred in one of twins, and presented clinical features of unusual interest. A Hungarian-American girl, age 7 years, was admitted to hospital with symptoms of more than three years' duration. She was unable to talk, walk or take nourishment, and presented signs of decerebrate rigidity. She lay motionless on her back, the head retracted in the median line, the eyes and mouth half open, and the hands and fingers markedly flexed; the legs were adducted and extended at the hip and knee joints the feet in a position of equinovarus. There was total absence of voluntary movement, but constant muscular twitching occurred in the eyelids and muscles of the lower extremities. On rotation of the head, with the chin toward the left shoulder, the left forearm after a few seconds became slowly extended at the elbow, the leg on the corresponding side becoming more rigid, while the opposite extremities became more flexed at the elbow and at the knee. Rotation of the head to the right caused extension of the right forearm and leg, with flexion of the contralateral extremities. The tendon reflexes were exaggerated, the abdominals and plantars absent, and the pupils sluggish in their reaction to light. Ophthalmoscopic examination revealed bilateral optic atrophy. The Wassermann reaction was negative.

Examination of the brain showed marked fronto-parietal atrophy, ventricular dilatation and atrophy of the cerebellum. The pathological changes included widespread cellular degeneration typical of amaurotic family idiocy; vacuolated cells containing amorphous deposits; atrophy of all cerebellar layers; rarefaction of medullary nerve fibres; marked degeneration of the deeper layers of the occipital lobe, and of the ganglion cells of the nucleus ruber; absence of secondary degeneration of the white substance of the brain and spinal cord; lipoid accumulation in the adventitial spaces of the blood vessels and in the subarachnoid space and but little inflammatory phenomena.

The author concludes that the distinguishing features of the late infantile type of amaurotic family idiocy are the existence of marked cerebellar changes and the relatively slight involvement of the optic thalamus.

Decerebrate rigidity is a prominent feature in all types of this disease, and should therefore suggest this morbid condition in obscure cerebral lesions.

R. M. S.

[66] **A case of cerebral cysticercus diagnosed during life** (Un caso di cisticercosi cerebrali diagnosticata in vita).—V. M. Buscaino. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 136.

A case is fully described both as to its clinical findings and post-mortem appearances. Insistance is laid on the importance of the presence of eosinophils in the cerebrospinal fluid especially when found in conjunction with psychical deterioration and extrapyramidal lesions. Incidentally attention is drawn to the possibility of asymmetry of position occurring with an intact cerebellum as a result of pyramidal lesions, as in the present case. The author considers that the absence of Janischewski's sign (turning inward of the palms when the arms are stretched vertically upwards with the palms forwards) is of importance in excluding cerebellar lesions.

R. G. G.

[67] **The diffuse periaxial encephalitis of Schilder** (Contributo alla conoscenza della encefalite periassile diffuse di Schilder).—U. Barodi and S. Ricca. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 588.

The authors describe the interesting case of a man of 48 who had had syphilis fifteen years previously and, later, two attacks suggestive of cerebral gumma, which were cured by specific remedies. He then exhibited signs of Schilder's encephalitis and subsequently died, antispecific remedies being unavailing. Multiple gummata in the organs were disclosed at autopsy. The pathology of the condition is discussed in relation to tumour and specific infection but no definite conclusion is reached.

R. G. G.

[68] **Diffuse sclerosis** (Die Bedeutung des Infektes für die diffuse Sklerose, zugleich ein Beitrag zur Klinik und Pathologie der diffusen Sklerose).—M. Bielschowsky. *Jour. f. Psychol. u. Neurol.*, 1927, xxxiii, 12.

The now somewhat old conception of diffuse brain sclerosis is being dismembered by the separation therefrom of three different conditions, viz., the disease of Pelizaeus, Merzbacher, and Krabbe; the blastomatous variety described by Cassirer and Lewy; and Schilder's encephalitis periaxialis. Bielschowsky's new case belongs to the last of these categories.

The patient was a man who at the age of 50 for an unknown reason lost all his teeth and three years later suffered from a vague illness with rise of temperature for which no cause could be found. Four years later similar attacks of fever recurred. They were then associated with apraxic-aphasic phenomena lasting only a few hours, and with a slight left pyramidal disorder disappearing some ten days later when the temperature fell. Three such attacks occurred. In view of the likelihood of some infection careful blood and other tests were made, with negative result. When the patient was examined

minutely by a neurologist some 14 days after the last attack no definite organic signs were found. Yet within a very short time the illness began once more, on this occasion with Jacksonian epilepsy of the left arm. A diagnosis of a typical disseminated sclerosis was made. The patient left hospital apparently very well, and appeared a month later with fever and soon unconsciousness set in. A cerebral tumour was thought a possibility. Coma of three days preceded death.

Pathological examination showed a general absence of myelin throughout the white matter of both hemispheres, with conservation of axones. The change stopped short of the cortex everywhere. The meninges were full of collections of cells (macrophages and lymphocytes); cells filled the vessel sheaths in meninges, cortex and spinal cord; perivascular gliosis-formation was seen in many places, especially in the frontal regions, on the boundary between grey and white matter, occasionally penetrating the former or occurring in it in a scattered fashion; among the demyelinated parts fibrous glia was prominent. These and other points substantiated the diagnosis of encephalitis periaxialis diffusa. The combination of inflammatory and degenerative tissue-reactions is seen in other states than Schilder's encephalitis, e.g., in general paralysis. Bielschowsky says that the findings in meninges and cortex have not been remarked in this condition before, and that they closely resemble what has been observed by Spielmeyer in spotted fever. A useful collation of cases of diffuse sclerosis of infective origin is given in the article, and a discussion of their relation to disseminated sclerosis.

S. A. K. W.

[69] **Abolition of speech (anarthria) during meningoencephalitis.**—K. Petren and S. Ingvar. *Acta. med. Scand.*, 1927, lxv, 602.

The patient was a young girl of eight years, who suffered from an acute illness of an encephalitic type, in which meningeal symptoms were also much in evidence. It is uncertain whether it belonged in fact to the class of epidemic encephalitis. In addition to pronounced cerebellar and general symptoms, for a whole month the child did not make the least attempt to articulate a single word or letter, though the larynx was normal and she constantly cried, sometimes loudly. Recovery was slow and, up to the time of reporting the case, imperfect.

In view of the marked cerebellar symptomatology, suggesting cerebellar or cortico-cerebellar involvement (the pyramidal system was intact), the authors raise the question whether the cerebellar component of the motor side of speech is so necessary that a severe disturbance of the cerebellar apparatus produces total anarthria; that is, whether cerebellar anarthria is a clinical possibility. They do not, however, answer their own question.

S. A. K. W.

[70] **Angiospasm of the nervous centres : attempt at a classification and pathogenesis** (Angiospasmes des centres nerveux. Essai de classification et de pathogénie.)—F. BREMER and H. COPPEZ. *Jour. de neurol. et de psychiat.*, 1926, xxvi, 563.

ALTHOUGH admitting that the cerebral blood vessels possess no vasomotor innervation, and that they are uninfluenced by adrenaline, the authors nevertheless believe that the cerebral arteries—like those of the retina—are subject to spasmodic occlusion. The causative factor probably depends upon the presence of mechanical or chemical irritants in the vicinity or in the circulation. An etiological and pathological classification of the various types of occlusion is suggested :

(1) Those due to local changes in the vessel walls (atheroma or syphilitic arteritis) ; the commonest and best known.

(2) Those associated with Raynaud's disease.

(3) Angiospasms dependent upon some exogenous poison (quinine, nicotine, lead).

(4) Those dependent upon some endogenous poison (as in Bright's disease, hyperpiesis, migraine and possibly idiopathic epilepsy).

(5) Angiospasms associated with a neurosis.

The symptoms are those of cerebral ischæmia and are primarily irritative and later paralytic in nature ; the symptoms of Dejerine's intermittent claudication of the spinal cord are cited in illustration. Treatment is mainly symptomatic. Benzyl benzoate combined with luminal is advocated for the immediate relief of the spasmodic manifestations. M. C.

[71] **Contribution to the symptomatology of cerebellar lesions** (Contributo alla sintomatologio delle lesione cerebellare).—V. M. BUSCAINO. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 382.

A CASE of a cyst in the right cerebellum is described which was diagnosed during life. The author pays special attention to the three following signs ; (1) asymmetry in the position of the head, which was inclined to the right side with rotation of the face to the opposite side. (2) Asymmetry of the arms held above the head with the palms facing forward, the right palm rotating inwards. (3) Asymmetry of the arms held horizontally forward, the right hand being at a lower level than the left. R. G. G.

[72] **Segmental macrosomic syringomyelia, probably from ascending neuritis** (Siringomielia segmentaria macrosomica del miembro superior derecho con pseudo hipertrofia muscular y grandes alteraciones oseas, de probable origen infeccioso neuro ascendente).—M. SOTO and L. E. ONTANEDA. *Rev. Argentin. de neurol. y psiquiat.*, 1927, i, 290.

THIS interesting case raises afresh the question of whether an ascending neuritis of infective origin can invade the central nervous system locally, producing

a clinical syndrome of syringomyelia with pronounced trophic changes of corresponding distribution.

The patient, a man of 36, had had an operation on the right hand for a local ulceration caused by the deposition of some larva (nature not mentioned) under the skin. Some twenty days after he felt acute pains in the cicatrix, radiating upwards. After their disappearance an interval of some nine years passed ere the other symptoms, suggestive of syringomyelia, gradually made their appearance. The trophic signs were confined to the right arm, the sensory changes to the segments from C3 to D6 inclusive, also on the right. Among the earliest spinal or root symptoms should be mentioned muscular twitching of the flexors of the right hand and fingers, a rare symptom in syringomyelia, and thought by the authors to have resulted from toxic invasion of the anterior horns. In any case the strictly local development of all the symptoms is undoubtedly impressive, and lends support to the view that an ascending neuritis may reach the cord. S. A. K. W.

[73] **Alcoholic toxic neuritis of the acoustic nerve, with report of one case** (Les toxinévrites alcooliques de l'acoustique ; a propos d'un cas).—HIGGUEL and CAMBRELIN. *Jour. de neurol. et de psychiat.*, 1926, xxvi, 557.

THE authors report a case of a barmaid of 40 who came under observation with a peripheral neuritis of alcoholic origin. Symptoms were present referable to the eighth nerve, viz., vertigo and deafness. Examination of the cochlear and vestibular apparatus revealed spontaneous nystagmus ; Rinné positive, Weber negative, Schwabach negative ; slight diminution of auditory acuity ; bilateral labyrinthine hyperexcitability.

Eleven other case collected from the literature are reviewed. Males are affected more often than females (10 to 1). The onset of symptoms is usually sudden. The cochlear division suffers more than the vestibular ; the affection is always bilateral, though not necessarily to the same degree on the two sides. Deafness and a continuous non-pulsatile tinnitus are the two main symptoms. Rinné's test is usually positive. Among the vestibular manifestations vertigo is the commonest ; nystagmus is rare. The prognosis is variable ; from the eleven cases quoted three were cured, three improved slightly and three became worse ; two patients could not be traced. The authors cannot recommend any particular line of treatment other than abstention from tobacco and alcohol. M. C.

[74] **Progressive multiple neuritis** (Neuritis multiple extenso progresiva, tipo de neurotabes).—ALURRADE and SEPICH. *Rev. Argentin. de neurol. y psiquiat.*, 1927, i, 272.

THE case was that of a youth of 20, with advanced postdiphtheritic palsies involving masticatory muscles, shoulder, arm and leg musculatures, as well as that of the trunk. In addition, the palate was paralysed, and the reverse

of the Argyll Robertson phenomenon was noted in the eye muscles. Severe sensory changes existed, implicating deep but not superficial sensibility. As in this case no serum treatment was administered, no connection between serum and paralysis was possible.

The case is unusual because of its progressive character.

S. A. K. W.

[75] **Contribution to the knowledge of paraplegia in flexion (Babinski type) of cerebral origin** (Contribution à la connaissance de la paraplégie en flexion, type Babinski, d'origine cérébrale).—Ludo van Bogaert and Rudolphe Ley. *Jour. de neurol. et de psychiat.*, 1926, xxvi, 547.

Among the causes of a cerebral variety of paraplegia in old age and arteriosclerosis, the type described by Marie and Foix is one of the more unusual. The case reported in the present paper was one of multiple vascular lesions, giving rise to a pseudobulbar syndrome, together with many of the features of Parkinsonism ; the intellectual state was one of senile dementia. The lower extremities were paraplegic in flexion (type Babinski). The right plantar response was of the extensor type and the left one flexor. Autopsy revealed sclerosis of the basilar arteries ; there was a progressive subependymal necrosis ; numerous lacunes of disintegration were present in the basal ganglia of both sides. The left globus pallidus and caudate nucleus showed an *état fibreux*. The right pyramidal tract was degenerated in all its length.

M. C.

[76] **Hemiplegia in flexion** (La hemiplejia en flexion).—J. M. Obarrio. *Rev. oto-neuro-oftalm. y de cirug. neur.*, 1927, i, 17.

By hemiplegia in flexion is understood a condition in which the lower extremity exhibits flexion corresponding in minor degree to that of the upper. According to the author this peculiarity and rarity is always associated with the syndrome of Foville. If the latter is on the same side as the hemiplegia in flexion the lesion is in the opposite crus cerebri ; if on the opposite side, the lesion is in the upper pons.

S. A. K. W.

[77] **Paradoxical behaviour of the medio-pubic reflex in hemiplegia** (Comportamento paradossale del reflesso medio pubico nella emiplegie).—U. Poppi. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 269.

This reflex consists in a contraction of the recti abdominis and the adductors of the thigh on striking the symphysis pubis. It is a true tendoperiosteal reflex and is not the same as the abdominal reflex, for the two may be found dissociated in conditions such as disseminated sclerosis and tabes. In hemiplegia both abdominal and medio-pubic reflexes are absent on the affected side, which is a paradoxical reaction.

R. G. G.

[78] **Corpus callosum and dyspraxia** (Corpo calloso e disturbi disprassici).—Carlo Berlucchi. *Il Cervello*, 1926, v, 1.

The first case here reported was one of tumour involving mainly the posterior and (in part) middle thirds of the corpus callosum, but dyspraxic or apraxic phenomena were not found during life. References are given to four or five recent callosal cases similarly characterised by absence of apraxia, though specially looked for. Accordingly, some revision of Liepmann's theory seems desirable, in the author's view.

His second case was also one of callosal tumour, which invaded much more than that structure in its posterior third, seeing that it passed outwards under the ascending parietal gyrus, involved the limbic area, and compressed also the caudate. In this case symptoms of the nature of tonic innervation were present, but no apraxia.

Some discussion of tonic innervation (Zwangsgreifen) is given, and of its possible pathogenesis, especially of the question whether it is of callosal origin.

S. A. K. W.

[79] **The reflex from the external malleolus and the phenomenon of Piotrowski** (Il riflesso del malleolo esterno e il fenomeno di Piotrowski).—K. Sagin. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 264.

The phenomenon of Piotrowski consists of a contraction of the gastrocnemius with flexion of the foot when the lower half of the tibialis anticus is struck with a percussion hammer. A similar result from striking the external malleolus is held by Sagin to be an extension of this phenomenon when reflex activity is specially raised. Others have denied this on the ground that the Piotrowski reflex is a musculo-tendinous response while that from the external malleolus is a periosteo-tendinous response. The author, however, maintains that the external malleolus reflex is never found in the absence of that of Piotrowski.

R. G. G.

[80] **An associated thumb-movement as a sign of pyramidal disease** (Daumen-Mitbewegungsphänomen als Pyramidenzeichen).—R. Wartemberg. *Klin. Woch.*, 1927, vi,

In many cases of pyramidal affection, slight or severe, the author has noted that when the patient tries to flex his fingers against resistance the corresponding thumb flexes and opposes. The sign has been described before, but this method of eliciting it is simple and useful. It has been shown to occur even when other pyramidal signs are minimal.

S. A. K. W.

[81] **Subacute combined cord degeneration.**—Walter F. Schaller. *Trans. Amer. Med. Assoc.*, 1926.

The case was that of a man of 58, who presented the usual symptoms of subacute combined degeneration, though the sensory symptoms were minimal, and in addition complained of occipital headaches and impaired hearing. The heart action was weak and intermittent, and cold sweats occurred.

Considerable interest attaches to the pronounced changes found in the brain cortex, which are distinctly unusual in the ordinary variety of the affection. Cortical atrophy seemed to have arisen from a primary involvement of nerve fibres, with secondary changes in nerve cells. Lipoid degenerations were present in the white matter, and plaques also in subcortical tissues. There was marked increase of glia without infiltrative or exudative reaction. It is also noteworthy that no special degree of anæmia was present during life.

S. A. K. W.

[82] **Familial spinal spastic paraplegia** (Paraplegia spinale spastica famigliare).—F. Cassinio. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 113.

The author describes the two cases of a brother and sister with spastic paraplegia. They were about 50 years of age, while another brother had died in early childhood with the same disease.

After discussing the views of various authors he come to the conclusion that congenital diplegias without mental symptoms and cases of family spastic paraplegia are examples of the same primary condition, viz., a failure of the proper development of the pyramidal tracts perhaps in the medulla which either prevents them functioning at all (the congenital cases) or causes the structures to die earlier than do the rest of the nervous structures.

R. G. G.

[83] **Observations and studies on the hereditary transmission of progressive muscular atrophy of the Charcot-Marie type** (Observazioni e studi sulla transmissione eriditaria dell' atrofia muscolare progressiva tipo Charcot-Marie)—L. de Lisi. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 390.

An elaborate study of family histories in this disease leads to the conclusion that while Mendelian laws cannot be applied simply or dogmatically, transmission may be recognised in this condition with the disease-process as a dominant, a simple recessive or a cosexual recessive. R. G. G.

[84] **A study of the vibratory sensation.**—R. S. Ahrens. *Arch. of Neurol. and Psychiat.*, 1927, xiv, 793.

Present knowledge concedes that the vibratory sensation may be felt in the soft parts, but that it is best recognised when contact is made with bone. As in any test which depends on the subjective sensations of the patient, a considerable degree of error is to be expected. Further, in this test we are not

dealing with a clear-cut cessation of sensation, but rather with a gradually diminishing intensity of sensation which fades into absence. A study of normal individuals shows that there is no predominating increased sensitivity in either right or left lower extremity or anterior sacral spine. In the upper extremity, however, the author found a definitely increased sensibility on the right side, a fact which suggests that deep sensibility is more acute in the extremity most used. In the field of neurology the most striking findings are encountered in tabes dorsalis, and there appear to be few exceptions to the rule that in tabes there always occurs a reduction in the time of appreciation of vibrations of fixed amplitude in the lower half of the body, and that this reduction in time is singularly constant over the sacrum.

Pernicious anæmia is another disease in which the quantitative estimation of the vibratory sensation promises to be of value. So far, no patient examined by Ahrens has shown a normal response to this test, the general tendency being for the sensation to be impaired or lost in the distal portions of the lower extremities with a gradual approach to normal in the upper extremities. In syphilis of the nervous system, other than tabes, changes in the vibratory sensation are not constant or characteristic, while in disseminated sclerosis the peculiar patchwork pathology may give any variety of sensory findings. In the early stages of posterolateral sclerosis a marked impairment is found in the lower limbs with an approach to normal as the upper extremities are reached, and as the disease progresses the curve approaches that of advanced tabes. Lastly, in peripheral neuritis there is a generalised impairment of the vibratory sensation, the upper and lower extremities being equally affected.

R. M. S.

[85] **Baryanæsthesia** (La baryanesthésie).—Z. Istvan. *Bull Soc. Roum. de neurol.*, 1926, iii, 51.

This brief communication deals with a rare phenomenon of peculiar interest, though unfortunately the details are not so complete as might be desired.

The patient, a man of 58, is a typical case of tabes with optic atrophy, resulting in blindness; the symptoms have been observed for at least eight years. Some two years ago, for the first time, he became aware of a sensation of extraordinary lightness of his body, with absence of all sense of fatigue after prolonged muscular effort. At first this experience produced in him a feeling of euphoria and hopefulness as to recovery, but was soon after followed by anxiety as to its real nature.

According to the author's account, examination shows no loss of muscular sense in arms or legs, but there is loss of pain sense and diminution of vibration sense in the latter limbs. However, Romberg's sign is present, while the patient feels when walking as though he were stepping on rubber. When he gets out of bed he has a pleasant sensation as though he were rising into the air "like an indiarubber balloon." This sensation recurs at intervals

during the day ; he often feels as if he were suspended or floating in the air. As a result, in the lower limbs he frequently exhibits the so-called dancing reflex, or reflexus saltatorius, commonly considered to be more or less exclusively a hysterical phenomenon, but not so in this case.

The illusion of levitation and of absence of any feeling of bodyweight deserves much closer examination than is here given it.

S. A. K. W.

[86] **Asymmetrical homonymous hemianopia and hemiakinesis pupillaris** (Ueber asymmetrische homonyme Hemianopsie und Hemiakinesis pupillaris).—Anton Lutz. *Graefes Arch. f. Ophthalmol.*, 1926, cxvi, 184.

Doubt has not infrequently been cast on the value of the pupillary reaction test of Wernicke as a means of differentiating between an anterior and a posterior hemianopia, and the author here adduces further evidence against its usefulness in this respect. Retrochiasmal lesions of one bandelette or tract by no means constantly result in symmetrical defects of the visual fields, and the various clinical combinations that may occur are examined at some length. Thus hemianopia of one eye with normal vision in the other is one possibility ; a paracentral scotoma on one side and no defect on the other can also occur ; a third possibility is homolateral integrity and loss of colour vision in part in the crossed eye. Other rarities are enumerated.

S. A. K. W.

[87] **Bilateral internuclear ophthalmoplegia** (Ueber doppelseitige Ophthalmoplegia internuclearis).—Anton Lutz. *Graefes Arch. f. Ophthalmol.* 1927, cxviii, 470.

The author has usefully compiled an account of previously recorded cases of this condition and adds a new case of his own. In all bilateral cases there is a characteristic dissociation of the double actions of the internal rectus : other ocular and pupillary defects may or may not accompany it. The lesions are sometimes syphilitic, sometimes vascular and inflammatory, sometimes traumatic. Only one case (Spiller's) has been examined pathologically. Lutz' case was that of a little girl of ten, in whom the ocular symptoms supervened on mumps. It seems clear that the lesion must involve the posterior longitudinal fasciculus.

S. A. K. W.

[88] **Unilateral ophthalmoplegia internuclearis anterior** (Ueber einseitige Ophthalmoplegia internuclearis anterior).—Anton Lutz. *Graefes Arch. f. Ophthalmol.*, 1926, cxvi, 376.

The patient was a man of 40, who showed the following ocular symptoms. (1) Right eye.—On his looking to the left, the right internal rectus failed to contract and no movement of that eye took place ; on convergence, however,

the muscle contracted normally. (2) Left eye.—With lateral deviation to the right, the left internal rectus contracted normally, but on convergence its reaction was nil.

The author explains that a single lesion will account for the phenomena; there are supranuclear paths to each internal rectus nucleus, which cross in the midline; if uncrossed fibres are responsible for movement of the eye to one side, and crossed fibres for convergence, then a lesion above the right internal rectus nucleus, implicating uncrossed fibres to it and crossing fibres to the corresponding nucleus of the other side, will produce the symptoms here described.

S. A. K. W.

[89] **Annular opacities of the cornea** (Ueber ringformige Trübungen der Hornhaut).—Anton Lutz. *Graefes Arch. f. Ophthalmol.*, 1926, cxvii, 231.

The commonest annular opacity of the cornea is the well-known arcus senilis, due to degenerative changes in Bowman's membrane and in the peripheral corneal parenchyma. A green-brown colouration of the peripheral margins of the cornea is an occasional finding in pseudosclerosis and in progressive lenticular degeneration. According to Bostroem it does not always take the form of a complete ring, and probably results from urobilin depositions in Descemet's membrane and in the deepest layers of the cornea.

A still rarer form is here described, known as the keratitis annularis of Vossius, presumably of inflammatory origin.

S. A. K. W.

[90] **Menière's disease.**—Anders Thornval. *Acta psychiat. et neurol.*, 1927, ii, 39.

The characteristic features of Menicre's disease are tinnitus auris, and reduction of auditory acuity and imperfect bone-conduction on the same side. To this combination is added the occurrence of vertiginous attacks, rudimentary, moderate, or severe. Actual loss of consciousness is a rarity. As a rule prodromata are awanting. During the attack nystagmus of a violent character is practically invariable; in ten out of twelve cases observed by the author the rapid movement of the nystagmus took place towards the affected side, being essentially of a rotatory type, and, in the majority of the cases, purely rotatory. Much less common is a horizontal nystagmus towards the sound ear.

Of much significance is the author's finding that even in aggravated cases of the affection reactions to rotatory and caloric tests are normal. Moreover, he has shown that even in the course of an attack it is sometimes impossible to obtain any reduction of the reaction normally following caloric action on the peripheral apparatus

He is convinced that Menière's disease has nothing to do with the labyrinth itself, considered as a peripheral organ. His explanation is that it is caused by central disorder of the otolith nuclear complex in the medulla oblongata, and that it is akin, with migraine, to epilepsy, though not strictly either otic migraine or aural epilepsy. The supposition is that the diseased condition is preceded by toxic ear trouble and the existence of dominant irritation bombarding the medullary centres ; when tension has reached a certain point, a sudden discharge occurs, viz., the Menière attack. Vomiting and the so-called ictus laryngeus are subsidiary phenomena. S. A. K. W.

PROGNOSIS AND TREATMENT.

[91] **A new treatment for infantile paralysis** (Principes généraux, technique, et résultats du nouveau traitement de la maladie de Heine-Medin).—H. Bordier. *Acta psychiat et neurol.*, 1927, ii, 1.

Dr. Bordier's treatment consists of a combination of spinal radiotherapy with diathermy. After determination of the main spinal site or sites of the lesions of poliomyelitis appropriate *X*-ray radiation is applied ; for children under two years the dose is about 200 units R per seance, for those who are older, an increase in proportion ; for the adult, 1000 units R. The direction of the rays is at right angles to the vertebral laminæ. After three successive irradiations an interval of about 25 days elapses ere a second series is undertaken.

The diathermy part of the treatment is intended to favour the nutrition of the tissues of the paralysed limb. It should be utilised from the outset, independently of the radiotherapy, and treatment should be performed daily, for about ten minutes. Dr. Bordier also employs the sinusoidal current. He gives figures derived from the results of this treatment in other hands than his own, according to which cures are claimed in 15 per cent. of cases, and amelioration in 75 per cent. (total number of cases treated, 65).

S. A. K. W.

[92] **Encephalitis lethargica.**—W. D. Patton. *Can. Med. Assoc. Journ.*, 1927, xvii, 436.

The interest of this brief communication resides in the description of the treatment of acute cases of epidemic encephalitis by dye-therapy. A solution of neutral acriflavine is freshly prepared, dissolved in normal saline, boiled and cooled to body temperature and given preferably by syringe with a fine needle and injected slowly. The author begins with 10 c.c. of 0.5 per cent. solution of neutral acriflavine in normal saline, and repeats the intravenous injections daily with a gradual increase till 25 c.c. is reached. He gives details of several cases in which excellent results were promptly obtained.

S. A. K. W.

Endocrinology.

[93] **Tumours of the epiphysis** (Tumores de la epifisis).—Manuel Balado. *Archivos Argentin. de neurol.*, 1927, i, 10.

This is a careful clinical and anatomopathological study of two cases of pineal gland tumour, together with a résumé of knowledge in respect of this comparatively rare condition.

Neither of the author's cases showed the macrogenitosomia præcox of Pellizzi, inaccurately thought to be characteristic of pineal tumours. Apart from general symptoms of intracranial pressure, the diagnosis is based on disorder of equlibrium, external ocular palsies, and signs of internal hydrocephalus. Histologically, both belonged to the so-called pinealoma type. There is a bibliography of over one hundred references given in the paper.

S. A. K. W.

[94] **The thyroid and its influence on character** (La tiroide e la sua influenza sul caratere).—C. E. Roberti. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 125.

The thyroid is one of the physical bases of psychic structure and gives a particular imprint on character according to its functional activity. This it does either by the action of its hormone on the general 'make-up,' and the sensitisation of the nervous centres and tracts by which the emotional mechanisms are expressed; or by means of its multiple humoral and nervous correlations.

Two types of character may be distinguished according to its degree of functional activity.

The hypothyroidic type is emotionally stable, only excitable with difficulty, and shows a certain slowness of all nervous processes.

The hyperthyroidic, on the other hand, shows an increase of general excitability, instability of mood and the most lively emotions.

These characteristics may coexist in part in certain cases and this the author describes as the dysthyroid type.

R. G. G.

[95] **Endocrine therapy.**—Louis Minski. *Jour. of Ment. Sci.*, 1927, lxxiii, 414.

Psychoses following pregnancy are quite common, and some of them may possibly be due to deficiency of ovarian extract as a result of inhibition by the corpus luteum, mammary glands or placenta, depending on the time elapsing after the pregnancy before the mental symptoms develop. Acting on the supposition that if the deficient ovarian secretion be administered to the patient the hormone balance ought to be re-established and the patient restored to normal health, this type of case was treated thus with gratifying results. On the other hand, some cases do not respond to this treatment, and it is possible in these cases there is another factor at work, perhaps psychogenic in origin. Also, about 50 per cent. of climacteric cases treated with ovarian extract made a good recovery, and in those which did not respond it was usually found that there was a tainted heredity, or that the climacteric was not the sole cause.

The writer thinks that in certain cases of mental disorder, viz., those cases which have passed through an acute stage of mania or melancholia and have then drifted into a condition resembling stupor, confusion or secondary dementia, an intensive course of thyroid treatment is often very beneficial. Large doses should be given over a period of six days. Some illustrative cases are quoted.

C. S. R.

Psychopathology.

PSYCHOLOGY.

[96] **Does the psychogalvanic reflex phenomenon indicate emotion?** —R. J. Bartlett. *Brit. Jour. of Psychol.*, 1927, xviii, 30.

This investigator concludes that the psychogalvanic phenomenon follows a variety of complex changing mental states many of which would ordinarily be described as 'emotional' and yet may yield to introspective enquiry cognition and/or conation only. It seems best in the present state of our knowledge to describe these complex states as an 'orectic process' in which 'feeling' and 'striving' are mingled; but in view of the fact that, when cognized, the initial phase of markedly conative experience, accompanied by deflection, is reported to be dominantly subjective in character, and that large deflections are obtained when the dominant awareness is one of being impressed by the cognized stimulus, it seems probable that the mental cause of the physiological change that brings about the deflection is of the nature of passive endurance or enjoyment rather than of active striving or willing. Among distinguishable occasions on which the phenomenon appears are the following: (1) When something not consciously expected and, at first, inadequately apprehended enters awareness; (2) when a task is concluded with satisfaction or relief; (3) when 'doubt,' 'anxiety,' 'fear,' 'apprehension,' intervene; (4) when states described in such terms as 'admiration,' 'expansiveness,' intervene.

A simple formula to cover these four cases presents difficulty. There is a common 'feeling' element but that in itself is possibly insufficient explanation. If it is right to look for the understanding in *complex* orectic process rather than in 'conation' or 'emotion' alone, we must seek a common conative element. The changing activity of 'striving' is not a common factor. 'Enjoying' or 'enduring' rather than 'striving' would seem to describe the active element in (2) and (4). The waiting attitude of 'alertness' is not a common factor. Possibly the expectant element in 'alertness' is the factor sought; but case (2) still seems exceptional. On the conative side is needed the equivalent of the purely subjective pathic state that was argued is the common factor in all feeling. Possibly that equivalent can best be described as a change in attentional attitude. Possibly the ultimate basis of the phenomenon is a change from non-voluntary awareness of, to voluntary attention to, a pathic state of the self, coupled, by speedy 'external reference,' with a becoming aware of a possibly 'significant' change in, or differentiation of, the 'presentational continuum.'

C. S. R.

[97] **The time sense.**—W. WINSLOW HALL. *Jour. of Ment. Sci.*, 1927, lxxiii, 421.

EXPERIMENTS in watch-guessing, in time willing, and in willed waking seem to warrant the conclusions (1) that a time sense exists ; (2) that the time sense works below the threshold of consciousness ; (3) that the time sense, therefore, is evidence of a subconscious self. C. S. R.

[98] **Sexual and social sentiments.** — J. C. FLÜGEL. *Brit. Jour. Med. Psychol.*, 1927, vii, 139.

SEXUALITY and sociality are antagonistic. A man in love is less obviously gregarious. Betrothal and marriage make matters no better in this respect. Religion, education, etc., endeavour to keep sex at a distance. The object of this paper is to enquire into the psychological and sociological basis of this antagonism. The views of McDougall, Trotter and McCurdy, who believe that the gregarious is quite distinct from the sexual instinct, are contrasted with those of Freud's libido theory. Freud believes that the instinctual energy involved is the same, social tendencies being only special differentiations of the sex instinct. Discussing the psychological differences according to Freud, the absence of the sensual element in social relationships is explained in terms of repression. The sexual instinct is present in an inhibited form. According to Freud's theory the 'aim inhibition' is connected with the fundamental repressions producing the 'latent sexual period.' The greater constancy and permanence of the aim-inhibited manifestations of the sexual instinct are connected, in the case of social ties, with the absence of reduction of instinctive tension such as is afforded by orgasm. Identification plays a more important part in social than in sexual ties. In the first case we desire 'to be' and in the second case we desire 'to have' the loved object. Another difference is found in the greater diffuseness of social ties. Love and identification occur for many individuals in place of concentrated love for a single individual. All these factors make social relationship between members of the same sex easier than between members of the opposite sex. In this connection Flügel coins the words 'homosocial' and 'heterosocial.' The greater development of male homosociality is due to the greater narcissism of women, which creates an antisocial influence. During the last century male narcissism has been greatly repressed and this has not taken place to a corresponding extent among women. This factor should not be over-emphasised. In feminine homosociality the libido is less 'aim-inhibited' than in male homosocial relations so that sensuality is more prominent in the former than in the latter. The widely distributed erotic sensibility of women causes them to introduce non-genital sexuality into their homosocial relationships. The satisfaction gained is to some extent antagonistic to the formation of homosocial sentiments. Women are more monogamous and less promiscuous than men ; this characteristic probably depends upon a lesser liability to dissociation of the sensual and tender

elements of love. This is an antisocial factor. Monogamy engenders jealousy in both sexes and this interferes with sociality. Women have more to gain by marriage than men; this fact also causes jealousy. A most important factor is that woman's work is often of a relatively domestic and unsocial nature as compared with man's. The seclusion of women in the home also interferes with social behaviour. The author does not fail to observe, however, that under present day conditions the influence of some of these factors is tending to diminish. The increased social life of women is following a heterosocial rather than a homosocial course. This automatically increases male heterosociality. The institution of the family is in some ways antagonistic, but in other ways favourable to social sentiments. Tracing the influence of the family through successive ages, certain changes have occurred which are compared with those taking place in the environment as a whole. Although the family is probably the most primitive and natural social unit, in the 'totemic age' it lost much of its importance as compared with the clan. In some ways, however, a satisfactory compromise occurred between jealousy and sociality. Later it became more important, but in the present times it is yielding its importance to social influences. Sociality implies less jealousy and exclusive possession. Romantic sexual love favours the formation of social sentiments because it implies 'aim-inhibition,' less egoism and narcissism, and increases sublimation and an overflow of love on to others. This overflow of love shows a deep-lying connection between sexual and social feelings. There is a simultaneous reinforcement of these feelings at adolescence. When the overcoming of exclusive rights in love is accomplished the antagonism between the claims of sex and society will be very much reduced.

ROBERT M. RIGGALL.

NEUROSES AND PSYCHONEUROSES.

[99] **Unilateral failure of lactation in a hysteric** (Agalattia unilaterale in un'isterica).—N. P. KASATCHENKO-TRIRODOFF. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 159.

THE author describes a case occurring at the fifth month of lactation in association with a unilateral hysterical syndrome. He ascribes the condition to a sympathetic inhibition of the secretion of milk of emotional origin.

R. G. G.

[100] **Neurasthenia in the tropics.**—HUGH W. ACTON. *Indian Med. Gaz.*, 1927, lxii, 1.

NEURASTHENIA here is regarded as nerve debility characterised by a general feeling of ill-health, which is associated with introspectiveness and a morbid dread that some disease is developing or will develop at a future date. Neurasthenia is considered to be a state of *real* ill-health associated with certain

existing causes, and not merely a feeling of ill-health. In the tropics there is a further association with certain predisposing causes that are more commonly present than in temperate climates. The exciting cause is due to depression of function of certain endocrine glands, mainly that of the thyroid, and to a less extent of the adrenal glands. These may be depressed by direct action of the toxins of many of the acute diseases that are common in the tropics. More rarely it is due to slow poisoning by chronic diseases such as malaria, syphilis, hookworm infection, etc. The most fertile cause is interference with the digestive functions which is brought about partly as the result of toxins and partly by putrefactive changes in the gut. The predisposing causes are much more numerous in the tropics, for there is a greater tax on the body as the result of the continued high atmospheric temperature and the excess of humidity; the tendency to the production of anæmia that occurs by lack of ventilation during the hot weather; the poor quality of the food during the hot weather; the unadaptability of the Indian cook to European methods of cooking; the fetish of exercise (the European has an idea that to keep fit in hot weather he wants plenty of exercise and this idea is more ingrained in the neurasthenic).

The first effect of the combined action of exciting predisposing causes is shown by a depression of the function of the thyroid gland. Coinciding with this is a similar change in the adrenal medulla, so that the tone of the sympathetic nervous system is at a lower ebb. The functions of the parasympathetic glands are not affected or may even be stimulated; thus sometimes there is increased function of the anterior lobe of the pituitary, which is shown by the skin being very harsh, combined with the loss of body fat.

The whole success of treatment depends on a complete diagnosis which often entails numerous careful and detailed examinations, both clinical and bacteriological. A complete cure depends on the ability of the physician to deal with the mental condition of the patient. The removal of the exciting causes naturally has to be dealt with, and of the acute diseases the writer places the enteric fevers first on the list. The chronic diseases are more often common exciting causes of neurasthenia. The importance of diseases of the alimentary canal in the tropics is very great, and they are the source of the most of the neurasthenia, dysentery especially so. Then the predisposing causes must be attacked. After-effects have then to be considered. These are endocrine defects and also loss of tone of the involuntary muscles as shown by atonic dyspepsia, cœcal stasis, etc.

C. S. R.

[101] **Emotional maladjustment during pregnancy, with possible relationship to enuresis in the child.** *Psychoanalytic Review*, 1927, xiv, 326.

In a group of 250 mothers of pre-school-age children it was found that 36 per cent. had been emotionally maladjusted during pregnancy. In 250 pre-school-age children 20 per cent. (from two and a half to six years) were

subject to enuresis—32 per cent. of the entire group. The study showed that these children had pathological emotional instability. Sixty per cent. of the mothers of children with enuresis had had emotional disturbance (depression and morbid fears) during pregnancy. The mother does not become suddenly adjusted emotionally when the child is born, so that the latter is subjected to an emotionally unstable environment from birth and becomes conditioned in some of the reactions which appear characteristic for this group. In all cases of enuresis, where organic disturbance is excluded, we may consider the enuresis as merely a symptom expressing an emotionally unstable child, and that in every case the child is responding to emotional instability in the mother either preceding or following birth. C. S. R.

PSYCHOSES.

[102] **The onset of schizophrenia.**—Harry Stack Sullivan. *Amer. Jour. Psychiat.*, 1927, vii, 105.

Study of onset of disorder in male patients seems to establish two factors preliminary to schizophrenic psychoses. Firstly, the appearance is late in a long series of subjectively difficult adjustive efforts. Secondly, it seems never to occur in those who have achieved if only for a short time a definitely satisfying adjustment to a sex object. Efforts to identify exactly the factors which cause milder maladjustive efforts to pass over into schizophrenia have not been successful. The author does not believe we are justified by accumulated facts in stressing the sex factor as of exclusive importance. Much more data are needed in regard to the onset of the malady; at this stage, however, there seems little reason to doubt that cultural distortions provided by the home are of prime importance. Maladjustment which was without a foundation of erroneous attitudes which parents or their equivalent had thrust upon the child has not been observed. Interpersonal factors seem to be the effective elements in the psychology of schizophrenia. The great majority of the author's patients have shown for years before the break clear signs of coming trouble. A number were of a simple psychoneurotic sort—hysterical incapacitations, reactions by obsessive substitutions, neurasthenic and anxiety conditions. Many incipient cases might be arrested before efficient contact with reality is completely suspended. Three sorts of maladjustive processes which do not lead immediately to arrest of the individual's struggle can be distinguished. They include sublimatory resymbolizations, compensatory motivations, and defence reactions. It is never easy to say just when the schizophrenic patient has crossed the line into actual psychosis. Schizophrenia is much more likely as an outcome than in those who have fairly integrated the experience of infancy, childhood and the juvenile period. It is interesting, however, that the longer psychotic collapse is escaped, the less the chance of a grave disorder, and the less typical any illness which ensues. In other words, a psychosis occurring in a psychopathic youth under, say, the age of 22, is in all likelihood frankly

schizophrenic ; but an initial psychosis occurring at, say, 30 will probably be a brief excitement, even if decidedly schizophrenic in type. This suggests that the psychopathic sort of maladjustment grows more effective as experience is accumulated, notwithstanding the fact that its interference with social efficiency may continue unchanged, or even increase. The motivation at work is in a general way conflicting groups of elaborated (and more or less successfully repressed) personal tendencies opposed by tendencies of the nature of ideals (cultural controls). The disturbance in reality-appraisal which has been slow in the prodromal stages, is now very swift, progressing to a state in which everything is involved in the cognitive efforts. This stage in which nothing is without an incomprehensible meaning, and the ordinary exchange of intelligence is palsied, may continue in relatively simple elaboration. This is the catatonic type. In it the conflicts remain unsolved and the struggle expands into cosmic dramas and the psychic processes revert through the ontogenic repertory, perhaps down to the most primitive. At any time, however, this situation may pass into one of a few typical attempts at readjustment. There may be a massive resynthesis amounting to recovery with profit. There may be a fragile reorganization prone to relapse under difficulties. Of grave portent is readjustment by paranoid processes. Finally, there is the practically irremediable hebephrenic type in which destruction of the conflict is achieved by disintegration of the acquired socially adopted tendencies, and along with this a dilapidation of the evolved structures influencing manifestations of simple naive tendencies. The motivations of such patients then become juvenile, childish, or even infantile. In the prodromal period one sees many who were " depressed " for a long time before the outbreak of frank psychosis. This is to be distinguished from the psychosis of depression. Perplexity is an important phenomenon of the incipient state. In this condition, extra-conscious material influences perceptions of reality to such an end that the patient becomes more and more entangled in contradictions, alternative notions, and illusions. Fear-states covering the gamut from phobia through terror, and from anxious feelings through apprehension, to fully developed primitive panic, are factors important in many incipient conditions. All three of these phenomenon-groups combine in the evolution of most schizophrenic psychoses.

C. S. R.

[103] **Hereditary relations in schizophrenia.**—Albert M. Barrett. *Amer. Jour. Psychiat.*, 1927, vii, 77.

Statistical evidence and the results of the analyses of individual families in which schizophrenia occurs indicate that heredity is an important factor to be considered in the etiology of schizophrenia. In a series of 150 unselected cases there were 117 or 78.01 per cent. that had heredity tainting factors, usually considered as of significance in the heredity of the psychoses. This is about equal to that found for psychoses in general and considerably greater than that of the non-psychotic 67 per cent. It is slightly less than has been

found in manic-depressive psychoses, 84.13 per cent., and in epilepsy 81.26 per cent. The most frequent tainting factor is psychoses. These occur among the mental abnormalities of the antecedents and members of the families in a percentage of 43.22. This is about three times greater than has been found in those who are not psychotic. It is about the same as occurs among the psychotic in general (45.9 per cent.). It is about equal to that existing in the heredity of manic-depressive psychoses (43.86 per cent.), and much greater than occurs in epilepsy (22.5 per cent.). Abnormal character occurs more frequently among the antecedents and members of the families of schizophrenic patients than in any other form of psychosis. It occurs as a tainting factor nearly twice as frequently as in manic-depressive psychoses (21.24 per cent. as compared with 11.5) and somewhat more than exists among the insane in general (18.8 per cent.). Mental abnormalities occur much less frequently among the parents of schizophrenic patients than in the psychotic in general. Parents of manic-depressive patients are more frequently tainted with mental abnormalities than are those of the schizophrenic. Schizophrenia has its heaviest heredity tainting in antecedents which are in indirect relationship to the patient. Indirect tainting in schizophrenia is more than twice as great as in manic-depressive psychoses, (38.3 per cent. as compared with 18.09) and much greater than in the psychotic in general. Schizophrenic patients are more tainted in atavistic relationship, i.e., grandparents, than are those who have manic-depressive psychoses, in the proportion of 25.64 per cent. to 15.5 per cent. The evidence obtained from the application of Mendelian theories to the investigation of the heredity course of schizophrenia tends to indicate that the transmission of the factors for the creation of the *Anlage* to schizophrenia follows the course of a Mendelian recessive character. The factor that is transmitted seems to be of complex rather than simple Mendelian character. Specific qualities of abnormality of temperament and character, which in general correspond to those designated as schizoid, occur with such frequency among members of families in which schizophrenia exists, that the thought is suggested that these may stand in some relation to the genetic course of the disorder. Non-schizophrenic psychoses and mental abnormalities occur among parents and families of schizophrenic individuals to a degree that suggests polymorphous heredity relations in this disorder. The existence of polymorphous heredity, however, is neither proved or disproved. While there is some statistical evidence of the occurrence of anteposition in the heredity course of schizophrenia, a critical consideration of the data on which this is based does not justify the acceptance of this as a regular occurrence. There is no certain evidence that the heredity course is in any way sex-linked. Consideration of the family stocks in which schizophrenia occurs tends to show the existence of certain specific characteristics that appear as schizophrenic phenotypes, or as specific qualities of temperament and character that may be manifested in various members of the family, or as a modifying influence in the shaping of the clinical form of psychoses that are not dominantly schizophrenic.

C. S. R.

[104] **Gastro-intestinal motor functions in schizophrenia.** — GEORGE W. HENRY. *Amer. Jour. Psychiat.*, 1927, vii, 135.

RADIOLOGICAL observation of gastrointestinal motor functions in 51 cases of schizophrenia affords the following general conclusions: 1. Definite changes in these functions are found. 2. The changes are somewhat characteristic of the different clinical types. 3. The more acute the psychosis is, the more abnormal are the changes. 4. Gastrointestinal motor functions are normal in chronic deteriorated cases. 5. The visceral reaction to intense emotions in acute schizophrenia is analogous to that observed in lower animals when experiencing fear, rage, etc. 6. In acute schizophrenia the colon is most susceptible to sympathetic control. 7. In acute schizophrenia sympathetic control of certain functions and concomitant autonomic control of other functions contributes to disorganization of digestive processes. 8. In 70 per cent. of acute, actively hallucinating cases there is retention of barium or of food residue in the colon for a period longer than five days.

C. S. R.

[105] **Results of the researches in the histopathology of dementia præcox made in the years 1924-25** (Risultati delle ricerche d'istopatologia del sistema nervoso di dementi precoci fatte nel biennio 1924-1925). —V. M. BUSCAINO. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 329.

THE evidence collected in this research shows that in a good number of cases evolutionary anomalies of the brain are found. These consist in abnormalities in the sulci and convolutions, persistence of the foetal cells of Cajal, diversity of the type of nervous cells, binuclear cells, etc., which arise from abnormal developments of the foetal nervous system. Dementia præcox develops in at least 50 per cent. of cases (based on observations undertaken in the last two years) in subjects who have already suffered from prenatal or postnatal lesions of the brain or of membranes (anomalies of development, foci of leptomeningitis, etc.). The histopathological facts in the development of the brain in dementia præcox show degenerative and not inflammatory processes. The lesions are essentially focal not only in the cortex but also in the basal ganglia, mesencephalon, cerebellum, pons, and also in the medulla. Generally lesions of the cerebral cortex are constant, and those of the thalamus almost constant. Lesions of the striate and other extrapyramidal nuclei are very frequent in catatonic cases. The brain of the dementia præcox case is thus permeated with microscopic foci of disease sometimes concentrated in extracortical areas, sometimes in the cortex itself. They are not uniformly distributed in all the lobes. Frequently, however, they have a preference for the frontal lobes, sometimes in one field, sometimes in another.

The biological process which is the basis of dementia præcox rarely produces organic lesions in the central nervous system of a degenerative type of exogenous origin. So far as the cortex is concerned, with a special predilection for the

third layer of cells, the agency would seem to be an organic basic substance of an ammoniacal type.

The irregular dissemination of the lesions, never identical in any two cases, accounts for the diversity of symptoms, while involvement of extrapyramidal areas accounts for catatonia. There is a real distinction between the psychology of the normal person and the dementia præcox case just because of these lesions; moreover, they can be catalogued by microscopical examination. A long appendix is added on the 'Zolle di disintegrazione a grappolo' which the author finds in cases of dementia præcox and amentia but not with definiteness in normal brains.

R. G. G.

[106] **Blood-groups in schizophrenia and manic-depressive psychosis.**—Theophile Raphael, Olive M. Searle, and William Scholten. *Amer. Jour. Psychiat.*, 1927, vii, 153.

From their experiments these observers conclude that seemingly no specific relationship can be established, on the basis of the ordinary standards, between blood-group distribution and schizophrenia and manic-depressive psychosis. As a corollary, from the standpoint of constitution, if there is a specific relationship obtaining in these psychoses as regards genotypic physiological pattern it does not appear to include the quality of blood type.

C. S. R.

[107] **Modern observations on heboidophrenia** (Vedute odierne intorno all' eboidofrenia).—M. Camia. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 147.

In 1890 Kahlbaum described a condition closely allied to hebephrenia which he called heboidophrenia. This he defined as an alteration of the psychic constitution of a man in relation to society (character, personality, or temperament) and alteration in the instinctive life amounting to a lack or perversion of the moral sense, which may result in actual criminal behaviour. Other symptoms (weakening of the intelligence, raising or lowering of the affective reactions) may occur in some cases but are not characteristic and may be altogether lacking. The author has noted the occurrence of such symptoms after encephalitis lethargica and describes two cases in relation to infantile cerebroplegia.

He concludes that heboidophrenia is not a clinical disease-entity, but is a syndrome whose symptoms correspond to those described by Kahlbaum. This syndrome may be met with in three clinical forms; dementia præcox, encephalitis lethargica and infantile cerebroplegia.

R. G. G.

[108] **The paranoiac constitution** (La constitution paranoïaque).—J. Levy-Valensi. *Prog. méd.*, 1927, liv, 549.

The main attributes of the paranoiac are arrogance, egotism, distrust, and false reasoning. Through these he is unadaptable to society. The child and primitive man are somewhat naturally paranoid as defence mechanisms develop. Paranoiacs have been arrested at this stage of development. At school they are often brilliant but tend to neglect those studies which do not please them and often develop the habit of instructing themselves in subjects out of the curriculum. In a large number of cases, though seemingly clever, they fail at examinations and accuse the examiners of injustice. The adolescent often hides his haughtiness under a cloak of false modesty and timidity. Pride and timidity at the onset of sexuality are liable to render him afraid of the normal expansion of his virility and bring about an abnormal genital life, with possible perversions. In the army he makes a bad soldier and soon terminates his military career because of his inability to submit to discipline. In everyday life the paranoiac is in evidence. He is seen in the restaurant as a customer who makes personal grievances concerning his food. On the Underground he shows ill-temper with the conductor over some triviality and when jostled believes the act is intentional, and is susceptible to fancied slights of all kinds. The same type is apt to be interested in often ridiculously petty inventions and tries hard to convince others of their worth. As a citizen, though scrupulously honest, he is ever apt to be lodging protests against the Treasury, police, postal authorities, etc., or wrangling with people with whom he has relations. The paranoiac is often altruistic, though the rule that altruism is not infrequently only dissimulated egoism is very applicable to this type. Among his tendencies there is excessive devotion to reforms, either political, social, mystical, or artistic, and the liability to become a propagandist of some political sect or some Utopian theory. In his love life he tends to morbid jealousy. His attributes may lead him to shun society and often he takes refuge in reverie, which can tend to create a fictitious personality. But in no way has this anything in common with schizoid states. Prophylaxis is more efficacious than treatment. In childhood any signs of the tendencies spoken of must be ferreted out and restrained. The child must be led to more correct adaptation to social life. Not much more, however, seemingly, can be done to prevent the development of the paranoiac constitution.

C. S. R.

[109] **Amok and Lattah.**—F. H. G. Van Loon. *Jour. of Abnorm. and Soc. Psychol.*, 1927, xxi, 434.

The most frequent psychosis of the Malay people is acute confusion, mainly caused by infection. Many of those suffering from confusion are very aggressive and some of them run amok, in its literal sense. Malaria and syphilis especially are exceedingly often the cause of these hallucinatory confusions;

other infectious diseases may have the same effect, while dementia præcox announces itself amongst the Malay very often by aggressive confusion. Kraepelin classified amok as an epileptic dream-state, which in Western society also sometimes leads to acts of violence. However, the great majority of such cases are not caused by epilepsy. In amok the aggression is not due to temper or rage but to an agony of fear, the patient in his hallucination imagining himself to be attacked by a tiger, a snake or a human enemy. After the attack, what has happened is often not remembered ; at times something is recollected, the last clear remembrance being that he was attacked. The Malay usually seizes his dagger or cleaver with which to defend himself against his supposed enemies. Often there may be flight, jumping into water, etc. Aggression does not manifest itself until some obstacle is met or somebody blocks the way. The terror may spend itself in suicide, self-castration or some other form of self-mutilation. The confusion may not be accompanied by such vivid hallucinations and illusions of terror ; in those cases the patient goes about naked, dancing, smashing things up, or putting fire to the house. In Europe and America these infections also are very often accompanied by delirium, yet this " infectious murder " hardly ever occurs.

The external cause to be taken into consideration is that the knife is much closer to hand. More important is the difference between the mind of the Malay and the psychic structure of the Westerner. In the former there is a readiness for all kinds of emotional complexes, especially affects, to flood and occupy entirely the consciousness, so that all counter-motives are wiped away and the affect completely rules thought and action. Amok is, therefore, to be considered as an acute infectious delirium, while the peculiar psychic nature of the Malay is responsible for the symptoms.

Affect-lability plays an important part in lattah as well as in amok. Lattah generally is found in middle-aged women. The great majority of them have had intercourse and a close contact with Europeans, mostly as servants. After a fright or some sudden emotion, the startled patient screams, after which she manifests echolalia and echopraxis and does everything she is told to automatically. These compulsory symptoms can be kept up as long as one wishes by using the element of fright again and again. They disappear as soon as she is spoken to quietly and soothed. Immediately after the fright the patient utters obscene words over and over again or makes indiscreet remarks. A dream of a highly sexual nature is generally reported as the immediate cause. In serious cases every sound, every harsh word, is sufficient to " make her lattah." Every new emotion has the same effect. All control over feelings is lost while the intellect remains intact. Thus, undoubtedly, lattah is also a primitive affect-reaction. The Malay is extraordinarily sensitive to suggestion, which explains the echo-symptoms and automatism by command. It is reasonable to connect this repeated psychic surrender symbolically with the primary repressed sexual desire-complex, which expresses itself in the dream, and

precedes the symptoms of the illness. In that case this psychic substitution, which Freud accepts especially in compulsion neurosis, would provide sufficient camouflage to protect consciousness against the reappearance of the repressed desire pictures. It is different from the Western picture of hysteria, and lattah-patients hardly ever present hysteric symptoms or stigmata. To a certain extent, lattah therefore is closely allied to amok; for we also here find a sudden flooding of consciousness by an intense affect. The lack of control is one of the striking points of the primitive psyche.

C. S. R.

[110] **A hypothesis of the mechanism of the functional psychoses.**—L. C. F. Chevens. *Jour. of Ment. Sci.*, 1927, lxxiii, 402.

The author has attempted to show that the mechanism in all the so-called functional psychoses is similar, i.e., the real situation is intolerable owing to the non-satisfaction of the patient's 'urges' and desires, so that satisfaction is acquired in a world of phantasy. This is true for paranoia, schizophenia, and the manic-depressive psychosis. Whereas those with normal personalities attack the actual environment and attempt to fit themselves to it or it to them, those who develop a functional psychosis have abnormal personalities, so that they shirk reality when it is unpleasant and retire into a pleasant thought world. This world is pleasant for the following reasons :—

1. *Paranoia.*—Failure to achieve is not due to inefficiency on the part of the patient, but to the machinations of others. The greater the delusions of persecution, the less the blame attached to himself in the patient's opinion. He is able to overlook his own imperfections and failure to satisfy his desires.

2. *Schizophrenia.*—The patient passively retires from his environment and satisfies all his desires in a world of phantasy.

2. *Manic-depressive psychosis.*—The patient is much more active and has struggled with environmental conditions. A precipitating cause can often be distinguished, which seems to cause the patient to give up the struggle and secure satisfaction temporarily in a world of phantasy. During the manic attack the affect is one of exaltation owing to the feeling of escape from all inhibitions and the feeling that all his desires have been realized. The mechanism might be described as the same for all cases, and summed up by the phrase "Escape into psychosis."

C. S. R.

PSYCHOPATHOLOGY.

[111] **Neuropsychiatry in China.**—J. L. McCartney. *China Med. Journ.*, 1926, xl, 617.

It has been estimated that there are at least 3,000,000 nervous and mental cases in China, and that one out of every one hundred and twenty-six persons is a neuropsychiatric case. At least 43 per cent. of these cases are purely psychiatric, thus showing that there are 1,341,600 insane or psychopathic persons in China. No government hospitals for the insane exist in China. In Peking an institution which sometimes goes by such a name is nothing more

than a prison where psychopaths are confined and sometimes put in chains. In Canton there is a Municipal Insane Asylum where two or three hundred patients are herded together. Two or three mission hospitals set aside a ward for mental cases. The only large institution conducted scientifically is the John G. Kerr Hospital in Canton which has a capacity for over seven hundred.

The mental constitute a very helpless class in China. If caught in the streets doing anything out of the way, they are arrested and thrown into prison as if they were criminals. If they are harmless they are mocked and laughed at and often stoned. Their families usually treat them as strangers and confine them in a dark room by themselves. Most are kept chained at home so that few know about them. There are no government restrictions. The head of the family is usually held responsible for any injurious acts of its members. The disposition to treat them cruelly is enhanced by the fear and dislike inspired by the belief that psychosis is due to possession by evil spirits. Another belief is that its cause is the presence of mucus choking up the internal organs within the chest. Some of the educated place the seat of the disease in the brain. Exorcism is a common practice.

Among the Chinese insane, 40 per cent. are between 20 and 30, 23 per cent. between 30 and 40, 9 per cent. between 40 and 50, 5 per cent. over 50 and 23 per cent. under 20 years of age. A study of statistics clearly shows that the proportion of insanity is highest where there is the greatest congestion of population and the places with a low insanity rate are settled by hardy farmers who are engaged in legitimate agricultural pursuits and who produce a strong human stock. It is generally accepted that psychoses are most frequently found in older civilizations, such as that of China, where the exigencies of times have wrought their havoc, and also in more thickly settled communities, where competition is most active.

C. S. R.

[112] **Epileptics in institutions in the United States.**—Horatio M. Pollock and Edith M. Furbush. *Mental Hygiene*, 1927, xi, 369.

Among other points the question whether epilepsy is increasing is dealt with. It appears probable from the incomplete data at hand that epilepsy is becoming relatively less of a problem in the United States. The census of epileptics taken by the National Committee for Mental Hygiene on January 1st, 1920, showed that, exclusive of the epileptics included among the patients with mental disease, there were on the date of the census 14,937 epileptics under treatment in institutions of the United States. The census of the Federal Census Bureau on January 1st, 1923, enumerated 12,936 epileptics in the same classes of institutions, a decrease of 2,001 compared with the previous census. The number of patients with epileptic psychoses in the New York civil state hospitals has declined in recent years. As the epileptic patients with psychoses probably constitute a nearly constant proportion of the total number of epileptics, it

seems probable that a decline in the number of epileptics in the community has also taken place. Such decline in epilepsy may be associated with the better care of infants, or the lessened consumption of alcohol, or may be due to unknown factors. In view of the serious nature of the disease, it is highly gratifying to observe its apparent decline, even though it still constitutes a serious unsolved health problem.

C. S. R.

[113] **The incidence of congenital syphilis in mental deficiency.**—J. Leslie Gordon. *Metropolitan Asylums Board Annual Report*, 1926-27, 290.

In respect of the Wasserman reaction as a means of diagnosis of congenital syphilis, it has been stated that age is an important factor, for the reaction tends to become negative in children who reach puberty. The results are recorded of this reaction on 575 defectives between the ages of 6 and 16. Of these cases tested at Caterham 485 gave a negative result and 90 a positive, giving a percentage of 15.65 positive. This percentage does not seem to bear out the statement that age or the reaching of puberty is of much importance in modifying the Wasserman reaction. It is, however, unsatisfactory to compare ages in two entirely separate series of cases. It would be preferable to re-examine the positives after they had reached adolescence and compare results. One point of interest found was the higher incidence of positive results where deficiency was complicated with congenital neurological lesions.

C. S. R.

[114] **Regressio mentis infanto-juvenilis** (dementia infantilis familiaris).—G. Corberi. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 301.

Under this title the author seeks to differentiate a syndrome distinct from cerebral nondevelopment, juvenile paresis, epileptic and other dementias. The picture of the mental regression is characterised by a gradual and inexorable failure of intelligence and loss of language in subjects who were apparently perfectly normal until the onset of the illness. Amaurotic family idiocy is distinguished by the loss of vision. Similar loss of vision is seen in tuberous sclerosis and diffuse sclerosis. The condition under discussion does not seem to be due to syphilis since all the tests are negative. The real cause of this condition is so far unknown, but it may be some familial endocrine imbalance.

R. G. G.

[115] **The acetic anhydride-sulphuric reaction for general paresis.**—A. G. Duncan. *Jour. of Ment. Sci.*, 1927, lxxiii, 419.

It is concluded that this reaction is positive in almost all cerebrospinal fluids. As a test for general paralysis, it is valueless, since many other fluids give just

as strongly positive results. The reaction depends on the presence of protein in the spinal fluid, and is probably identical with the Hopkins-Adamkiewicz test. C. S. R.

[116] **Basal metabolism in mental cases** (L'étude du metabolisme basal chez les aliénés).—G. BADEANO. *Bull. Soc. Roum. de neurol.*, 1926, iii, 28.

A LONG investigation leads to the following general conclusions :

(1) In the psychoses of chronic alcoholism the basal metabolic rate is constantly reduced.

(2) In cases of dementia præcox and of general paralysis it is of importance to bear in mind that processes of inanition and of consumption often coexist in the same individual. If inanition exceeds consumption the basal metabolic rate diminishes ; if consumption exceeds inanition, the rate increases. One process may practically cancel the other, in which case the rate remains more or less normal.

(3) Psychomotor agitation (alcoholic, maniacal, or paralytic) exercises no influence on the rate, which is an expression solely of the states of inanition and/or consumption.

(4) There is no connection between variations of the rate in general paralytics and the clinical state of the patient concerned, except when the final period of cachexia is reached. J. S. P.

[117] **The physiology of psychic processes** (La fisiologia dei processi psichici). —E. SCHEINER. *Riv. di pat. nerv. e ment.*, 1927, xxxii, 349.

THE author reviews the work of Sherrington, Pawlow, Bechterew and the American behaviourist schools and suggests that psychiatric syndromes can be explained on the basis of alterations in conditioned reflexes.

In psychasthenia and traumatic neurosis there is a diminution in the power of forming new conditioned reflexes and insufficient " force " in those already formed. Mania of persecution is a " social " conditioned reflex of defence. Normally this is adequately differentiated to meet real dangers. In the primary phase of paranoid conditions the reflex is generalised ; in the second phase it is concentrated on definite objects. The evolution of the full paranoid state depends on the addition of new stimuli to those which usually determine the reflex of defence.

The author admits that such examples do not explain everything in psychiatry.

R. G. G.

PROGNOSIS AND TREATMENT.

[118] **A short report on some therapeutic investigations carried out at the Ranchi European Mental Hospital.**—Owen Berkeley-Hill. *Indian Med. Gaz.*, 1927, lxii, 243.

Six cases of dementia præcox were treated by induction of aseptic meningitis. On the whole the results were disappointing as compared with those obtained by other workers, who have claimed 50 per cent. of successes. In spite of the disappointing results, the investigation is worth carrying further.

Five mental cases were treated by the intensive use of bromides. The first case was that of a patient with dementia præcox who was highly delusional, very excitable and prone to bursts of the most violent abuse. The dosage was up to 210 grains a day. After thirteen days' treatment it was observed that the patient was very much quieter than before and much less abusive. A mischievous and destructive imbecile was found to have become much quieter and better behaved. Three other dementia præcox patients who had given much trouble after varying lengths of this treatment were found to have distinctly improved in behaviour.

Twelve patients with varying psychoses were treated with malarial fever artificially induced. An acute confusional patient showed a melodramatic change and suddenly regained his mental health. A doubtful general paretic became perfectly well and remained so for seven months, while another such patient showed no improvement and died suddenly of lobar pneumonia. A psychotic patient with cerebral syphilis and (?) tabes dorsalis showed no improvement and also died. A typical manic-depressive showed no change for five months and then recovered. A patient with Korsakow's syndrome evinced no betterment after treatment for thirty days, but subsequent to his discharge a recovery took place. In three cases of dementia præcox no mental change was observed but a fourth case showed some improvement. A patient with anergic stupor seemingly obtained no benefit and died. Another who was manic-depressive underwent no change.

Treatment by endocrine substance was tried in four cases. It consisted in giving thyroid (5 grains) once daily in the early morning and lymphoid compound tablets with orchitic (or ovarian, as the case required) extract (two tablets, twice daily after the principal meals). A manic-depressive patient improved very much in two months and later recovered. A dementia præcox patient from being dull and pathetic became a good worker as a cobbler. One imbecile improved very much, while another showed no particular alteration.

C. S. R.

[119] **The reasons which hinder the progress of research on the malarial therapy of paresis and the future direction of these studies** (Le ragioni che ostacolano il progresso delle ricerche sulla malarioterapia della demenza paralitica e le direttive future di questi studi).—G. SANTANGELO. *Riv. di pat. nerv. e ment.*, 1926, xxxi, 273.

THE author considers that many of the hypotheses on which this treatment has been based are erroneous and favours the idea that the main factor is the biological antagonism between the spirochaete and the plasmodium. This can be shown in vitro as well as under other circumstances, *e.g.*, in the experience of natives who when affected with Leishman parasites go to a malarial district to get cured. He, therefore, thinks that future research should be directed towards finding a still more antagonistic parasite, either of the malarial or of some other group altogether.

R. G. G.

[120] **The malaria treatment of general paralysis.**—A. FERRARO and T. C. C. FONG. *Jour. Nerv. Ment. Dis.*, 1927, lxv, 225.

THIS is a long, detailed, and comprehensive study of the results obtained by treating 120 cases of general paralysis with malarial inoculation. Its usefulness is increased by the numerous references, in statistical tables, to the results of other workers in the same field. Personal figures are given as follows:

Cases	*Very good remissions*	*Partial remissions*	*Slight improvement.*	*Unimproved*	*Deaths. Acute malaria*	*Other causes*
120	31	29	6	34	6	14

Of interest is the question which clinical type of general paralysis is most likely to be influenced beneficially by malarial methods. The authors have found as follows (figures expressed in percentages).

	Depressed type	*Manic type*	*Expansive type*	*Demented type*
Very good remissions	66	41.6	29	7.9
Partial remissions ...	8.3	36.4	34.3	28.6

The conclusion is that the type which offers the highest probability of success is the manic type, followed by the depressed and the expansive-paranoid type respectively. The dementing type offers considerably more resistance.

The greatest number of very good remissions are found between the ages of 26 and 40.

The first serological element which improves following malarial treatment is the pleocytosis, which is reduced within a few days. Of cases of more than two years' standing 95.7 per cent. show great improvement, and 50 per cent. a complete return to normality. As for the Wassermann reaction in the fluid, the rate of improvement within the first six months is 20 per cent., increasing to 90 per cent., within three years; 68 per cent. of these yield a negative reaction. The colloidal gold test is the element most resistive to treatment, and the reversal to a normal curve is very rare.

No parallelism exists between clinical and serological improvement at first, yet within two years the percentage of improved cases of each category is practically the same.

As for symptoms and signs of the neurological series, no definite conclusions can be drawn. Changes in the direction of improvement are found both in cases that react to malarial therapy and in those that do not ; further, even in some cases with very good remissions some of the neurological symptoms were aggravated. Dysarthria, incoordination, and tremors are among the symptoms which commonly improve ; convulsions are apparently uninfluenced. J. S P.

[121] **The induction of abortion in the treatment and prophylaxis of mental disorder.**—J. R. Lord. *Jour. of Ment. Sci.*, 1927, lxxiii, 390.

After a resumé of historical facts, the subject is dealt with under three aspects—ethical, sociological (eugenic, legal, and economic), and medical. We do not know enough of the laws of heredity to justify interference with natural or sexual selection on the grounds of racial interests. Historically, ethically and sociologically, abortion is not justified on the grounds of large families and poverty, the mother being healthy. The law does not forbid the induction of abortion during pregnancy, if it is to save the life of the mother. Some authorities add : " if such is likely to result in temporary or permanent ill-health of the mother." Ill-health should include both mental and physical health. All acts are lawful which are done in the course of proper treatment and in the interests of the patient. Speaking broadly the law never justifies abortion. There is no such thing as justifiable abortion in law. The law is blind, and has nothing to do with abortion when undertaken for medical reasons only. A curious attitude of the law is that it is not homicide to kill a child *in utero*, but if it is born alive and then dies from injuries sustained while *in utero*, the alleged offender in this case can be charged with manslaughter or murder. The only morally sound reasons for inducing abortion are medical. These are, to preserve life, alleviate or cure serious physical or mental illness, or prevent serious ill-health, physical or mental, whether permanent or temporary. Have we sufficient facts to justify abortion for curing or alleviating mental disorder ? If so, what kinds of mental disorders are susceptible to this treatment ? Short of this information it would be useful to know what mental disorders are not likely to be cured or improved by this means. The prevention of mental disorder might be discussed in its relationship to first attacks and to recurrent attacks of mental disorder. Have we sufficient grounds to justify the risks of abortion in a case of early pregnancy, say, with a psychopathic heredity and signs of mental instability ? Is either of these conditions *per se* a good reason for the induction of abortion to prevent the possible occurrence of mental disorder ? In regard to the possible prevention of recurrent attacks, it is difficult to say that the induction of abortion is not justifiable. The modern practice of inducing abortion in order to prevent the occurrence or recurrence of mental disorder is extending.

C. S. R.

[122] **Careers of patients discharged against medical advice from St. Elizabeth's Hospital, 1920-1925.**—Elmer Klein and Roger S. Cohen. *Mental Hygiene*, 1927, xi, 368.

Of the 162 patients discharged against medical advice about whom information was obtained, 18 died from natural causes without readmission to a hospital for mental disease. Of the remaining 144, 87 per cent. were unable to adapt themselves to a normal community life. Had they been permitted a longer period of convalescence under a protected hospital environment, some of them might have done so. Certainly much expense and disappointment to relatives could have been avoided. Seventy-four per cent. of the 144 cases had to be rehospitalized, in some cases several times. It would be futile to draw any statistical conclusions concerning the commission of crime, so few were the answers received in regard to it. That it is a consideration of moment to society is evident from the fact that major crimes had been committed by two members of the small group about whom definite information was possessed. The same may be said about suicides. Only 13 per cent. of the 144 were making a more or less satisfactory adjustment in society. Had more been heard from it is probable that this percentage would have been even lower. The results clearly show the necessity for accommodation between the attitude of society and the attitude of the psychiatrist. In many mental cases prognosis is hazardous even for the trained psychiatrist. That in the cases studied professional opinions were superior to lay hopes and the decision of courts is, however, evident from the results here found.

C. S. R.

Reviews and Notices of Books.

A Text-book of Psychiatry for Students and Practitioners. By D. K. Henderson, M.D., F.R.F.P.S., Physician-Superintendent, Glasgow Royal Mental Hospital, etc., and R. D. Gillespie, M.D., D.P.M., Physician for Psychological Medicine, Guy's Hospital, etc. London: Humphrey Milford, Oxford University Press. 1927. Pp. 520. Price 18s. net.

Each generation of students gets the textbooks it requires. If these exhibit considerable variations in manner and matter this must be the outcome of individualistic points of view and of mass trends in thinking and practice. For assuredly a change has come over psychiatry in the course of the last twenty years, and it is reflected clearly in the pages of Dr. Henderson and Dr. Gillespie's textbook. Whether such a change is indicative of unidirectional movement with some pretence to permanence or merely of an experimental variation it is doubtless premature even to discuss. The point of view assumed by the collaborators is briefly that of Adolf Meyer, who regards mental illness as produced by abnormal or unhealthy reactions of a mind to its environment, and in a specific case seeks to trace all the factors responsible for these reactions. Thus there is here a notable departure from certain other schools of nosology; we read less of diseases and more of "reaction-types"; in place of the more or less schematised forms of mental disorder that have hitherto, at least to some extent, answered their purpose the student will learn of affective reaction-types and of organic reaction-types, and will gather that less attention is to be paid to clinical syndromes and more to the individual's personality and the way in which he meets his problems. In order to emphasise this plan of approaching a psychopathological case the authors have selected a large number of case-histories illustrative of clinical varieties and have reproduced them in no little detail. The advantage of the method is obvious; one of its disadvantages is that the reader's faculty of visualising subjectively what is known to the authors objectively may be very imperfect.

The chapter devoted to general symptomatology is full of useful definitions and explanations, though exception might be taken to one or two statements (*e.g.*, irritation of "the tip of the temporal lobe" is responsible for hallucinations of smell in organic cases, when the uncinate gyrus is meant); under disorders of memory reduplicative paramnesia is not mentioned, fairly common though it is, and of much psychological interest. That concerned with general psychopathology presents a conspectus of Freudian theory and its developments, didactic rather than critical, eclectic rather than comprehensive; it is eminently fair and highly practical in its bearings. Later sections, devoted, as has been indicated, to descriptions of reaction-types, comprise the psychoses

and psychoneuroses and cover the usual psychopathological range. Chapters of technical interest (Method of Examination, Relations of Psychiatry and Law, Occupational Therapy) round off a volume which differs materially from many preceding textbooks of its class and which is calculated in a notable degree to compel the student to think. It is written in a readable style and is well arranged; we should consider, further, that it will prove entirely satisfactory to "work from," even if there is not a single diagram or illustration in the book.

The Endocrine Glands and Autonomic Systems in Dementia Præcox: Clinical and Experimental Investigations. By GABRIEL LANGFELDT, Neevengaarden Mental Hospital, Bergen, Norway. Bergen: J. W. Eides; London: H. K. Lewis & Co. 1927. Pp. 326. Price 7s. 6d.

LOOSE statements to the effect that dementia præcox is an endocrine disorder are frequently met with in modern psychiatric literature, yet real and precise research in elucidation of the possible relationship of the two has seldom been undertaken. In this monograph the reader will find no less than 40 cases of admitted dementia præcox analysed from the standpoint of exact technique in respect of metabolic and other analogous tests—basal metabolism, carbohydrate metabolism, blood picture, functional tests for the visceral nervous system. These elaborate investigations, conducted over a long period, have led the author to formulate the following, among other, conclusions.

Catatonic variety: essential disturbances consist in slow pulse, low blood pressure, lymphocytosis, swelling of lymph glands, exaggerated reaction to pilocarpin, signs of vagotonia, reduced basal metabolism. In acute phases dilated pupils, tachycardia, exophthalmos (sympathicotonia) and reduced glucose tolerance may be found.

Hebephrenic variety: in acute and chronic phases only signs of sympathicotonia are present, such as tachycardia, exophthalmos, tremor, dilated pupils, reduced glucose tolerance. Basal metabolism and blood picture are alike normal.

It is held that the essential disturbances in catatonia agree with the clinical syndrome of a status thymolymphaticus. The sympathetic phenomena are considered as being provoked by the struggle of the organism against the factors that cause the psychosis to become manifest. It is probable these sympathetic disorders are of central origin (basal ganglia, midbrain). As for hebephrenia, the somatic findings are an expression of a sympathicotonic constitution.

At the basis of the psychosis is a specific inferior endocrine formula, which is responsible both for the development of the special constitutional type of the psychotic and for an inferior development of the brain. When this inferior system is exposed to too great a strain the acute phases of the psychosis make their appearance. Thus the essential constitution is considered to be the cause of the prepsychotic personality, while acute impairment of the endocrine

system accounts for the incipient emotional and other symptoms. Dementia follows from the action of endocrine toxins on a brain possibly hypersensitive to them. Should neuroglandular equilibrium become established clinical remissions ensue, with persisting defects in greater or less degree.

The author's working hypothesis is ingenious, and appears justified from a review of the data here presented and summarised in impressive tables. There is a bibliography of no less than 486 references.

Therapeutic Malaria. By G. de M. RUDOLF, M.R.C.S., L.R.C.P., D.P.H., D.P.M., Assistant Medical Officer, Claybury Mental Hospital. London: Humphrey Milford, Oxford University Press. 1927. Pp. 223. Price 12s. 6d. net.

THE vogue which the malarial treatment of general paralysis is at present enjoying has been responsible for innumerable contributions in medical journals at home and abroad, but there is a certain satisfaction in the appearance in book form of a compendious account of technique, complications, and therapeutic results, written by one who has made himself a master of his subject. Here in relatively small compass the practitioner will find all that he needs in respect of therapeutic practice, while the parasitologist and those who are interested in tropical diseases cannot fail to realise that "artificial" malaria brings its own contribution to the sum of knowledge that comes within their sphere. The neurologist and psychiatrist, too, will peruse Dr. Rudolf's pages with instruction, none the less because of the notably cautious and fair comments which he passes on his clinical results, derived from a study of some 63 personally treated cases. Numerous charts and several plates, and an excellent bibliography, combine to render this publication as complete as is possible when the essentially experimental nature of the treatment is borne in mind. Dr. Rudolf shows that the remissions obtained in general paralysis by the malarial method surpass those of any other method both as regards quantity and quality, yet he does not allow himself to "plump" for it as the therapy of choice in any sense other than that it is the least unsatisfactory at present known to the clinician. Whether some day a totally different therapeutic technique will be evolved is for the future to decide. Good as it appears to be, a non-specific treatment must be relinquished, one supposes, should a specific treatment eventually be elaborated. In the meantime, this excellent little volume fulfils its purpose admirably.

Handbuch der Psychiatrie. Edited by Professor Dr. G. ASCHAFFENBURG. Allg. Teil: Bd. I. Normale und pathologische Anatomie und Histologie des Grosshirns. By Professor Dr. A. JAKOB (Hamburg). Leipzig and Vienna: Franz Deuticke. 1927. Pp. 457. Price M57; bound, M60.

THIS is a very fine production from every point of view. As a manual of cerebral neuropathology it will at once take a foremost place; and since nearly one-half of the volume is devoted to the normal histology of the nervous

system, it must prove of equal interest to the physiologist and anatomist. There are some 270 illustrations in the text, the great majority of which are in colours, while almost all are original—an additionally satisfactory feature. Paper and typography leave nothing to be desired.

Dr. Jakob covers his field with conspicuous lucidity and in an orderly and comprehensible fashion ; his accumulations of material and his store of erudition are alike unusual in these days of easy book-making. His third chapter, on normal neural histology, is the best and most wide-ranging compendium of knowledge in this respect with which we are acquainted ; in particular, the sections on neuroglia are complete in their modernity. An attractive feature of the sections on neuropathology is the author's plan of printing consecutively drawings or photographs of sections from the same piece of material but stained by different methods, thus providing a series of views of microscopic changes in the tissues taken as it were from different angles yet capable of being suitably blended by the reader's mind, so as to give him a proper idea of their totality. To enter into any detailed description or criticism would require more space that is at our disposal but we have sufficiently indicated the scope of the volume and its authoritative character. Few books merit the encomium of indispensability ; Dr. Jakob's belongs, however, to the select few.

S. A. K. W.

Mikroskopisch-topographischer Atlas des menschlichen Zentralnervensystems. By Professor Dr. Otto Marburg, Director of the Neurological Institute of the University of Vienna. Third enlarged and revised edition. With 40 illustrations in the text, and 32 plates. Leipzig and Vienna : Franz Deuticke. 1927. Pp. 226. Price M28 ; bound, M33.

It is nearly twenty years since the last edition of this atlas was published, a book with which many neurologists at home and abroad became familiar, and which served as an admirable introduction to the minutiæ of neuro-anatomy. Intervening years have witnessed considerable advances in knowledge even of the pure morphology of the nervous system, especially in regard to the cortex and the basal ganglia and its connexions. Professor Marburg has incorporated recent acquisitions in this third edition, which is remarkably complete in its descriptions and particularly to be recommended for its finely drawn plates—in the reviewer's opinion always preferable to photographic reproductions. The illustrations in the text, further, especially those of cell-groups at various levels, are sure to be useful. References cited at the bottom of the text pages enhance its value materially for those who wish to work further on any special point.

With commendable ambition Professor Marburg furnishes the reader with the Latin terminology, and the German, English, French and Italian equivalents, for the various neural structures illustrated in his plates. No doubt this has meant a great deal of labour, and on the whole the outcome is satisfactory. Yet there are a regrettable number of mistakes and misprints

in the English renderings; some are obsolete and others frankly misleading. Had he had the services of some neurologist familiar with English teaching it would have been advantageous (incidentally, we find occasional errors of the same category in the French and Italian terms). For example, we rarely if ever use the term "scissure" for sulcus; nor do we speak of the "fleece" of a structure when we mean its capsule. We never refer to the "ambigual nucleus," or to the "medullary centre" of a cerebellar lobe. These blemishes, however, in no material way detract from the excellence of this atlas, which we welcome as an eminently practical addition to the neurologist's library.

S. A. K. W.

Le Syndrome Paralytique Unilateral Global des Nerfs Craniens. By Dr. Raymond Garcin, Interne (Gold Medallist) of the Hospitals of Paris. Paris: A. Legrand. 1927. Pp. 225. Price not stated.

Multiple, unilateral, cranial nerve palsies are always of clinical interest, whether they result from a polyneuritis cranialis or from meningeal or neoplastic lesions implicating the base. In particular, sarcoma of the base, a not infrequent condition, is responsible for a clinical picture in which one or other cranial nerve syndrome occupies the foreground. Dr. Garcin's *These* is concerned with the analysis of a considerable number of such cases, some of which are personal while others are specially selected from the literature. The author distinguishes:—

A syndrome of the sphenoidal fissure (2, 3, 4, 5 and 6);
A syndrome of the cavernous sinus (outer wall) (3, 4, 5, and 6);
A syndrome of the petrous-temporal (2, 3, 4, 5 and 6);
A syndrome of the apex of the petrous (syndrome of Gradenigo), (5 and 6);
A syndrome of the internal auditory meatus (7 and 8);
A syndrome of the foramen lacerum posterius (9, 10 and 11);
A syndrome of the jugular and anterior condylar foramina (9, 10, 11 and 12);
A syndrome of the posterior retroparotid space (9, 10, 11, 12 and cervical sympathetic).

Taken as a whole, this thesis forms a useful contribution to the study of varieties of cranial nerve palsy occurring unilaterally, and is worthy of the neurologist's attention.

Angina Pectoris: the Anatomy, Physiology, and Surgical Treatment By Walter B. Coffey, M.D., F.A.C.S., P. K. Brown, M.D., and J. D. Humber, M.D. New Orleans: A. J. Dickerson. 1927. Pp. 393. Price not stated.

This well printed and handsomely illustrated volume deals mainly with the surgical treatment of angina pectoris, twelve cases being reported in considerable detail. The procedure of the authors has been to cut the left superior

cardiac branch of the cervical sympathetic and the main chain below the superior cervical ganglion, and this has been followed with conspicuous success in some of the cases here recorded. Their theory is to the effect that angina is primarily due to spasm of the aorta and perhaps also of the coronaries, separately or simultaneously. The superior cardiac nerve exercises a constrictor function, since section of it prevents the spasm. A bilateral operation may be necessary in some instances. Since collaterals pass to the vagus at the level of the ganglion, it may be advisable to cut also the superior cardiac branch of that nerve.

The technique of the operation is described at great length and illustrated in a series of fine photographic plates. Other equally finely reproduced plates present a series of dissections of the sympathetic system and are of considerable value from the viewpoint of the pure anatomist.

Postencephalitic Respiratory Disorders.—By Smith Ely Jelliffe, M.D., Ph.D. (Nervous and Mental Disease Monograph Series, No. 45.) New York and Washington: Nervous and Mental Disease Publishing Company. 1927. Pp. 135. Price $2.50.

Among the manifold sequelæ of encephalitis lethargica disorders of the respiratory apparatus form a small but a highly interesting group. A monograph devoted to their study should therefore be of considerable value, especially since the bibliography of the whole subject is now so enormous and so scattered.

The present volume affords an excellent resumé both of the history and of the clinical aspects of the respiratory disorders which have been noted to follow encephalitis. Two personal cases are fully reported. After a discussion of the somatic pathology the author goes on in the latter part of the book to present more completely than has hitherto been attempted the psychological problems afforded by his cases. A psychological explanation of the symptoms is offered, based apparently on the theory of regression. The author concludes by expressing his belief that a psychoanalytical method of approach offers the most hopeful prospects in treatment.